

ATTRACTING WOMEN TO STEM PROGRAMS:
THE INFLUENCE OF GOAL-ORIENTATIONS AND
THE USE OF GENDERED WORDING IN RECRUITMENT MATERIALS

by

LESLY R. KROME

B.A., University of Alaska, Anchorage, 2010
M.S., Kansas State University, 2013

AN ABSTRACT OF A DISSERTATION

submitted in partial fulfillment of the requirements for the degree

DOCTOR OF PHILOSOPHY

Department of Psychological Sciences
College of Arts and Sciences

KANSAS STATE UNIVERSITY
Manhattan, Kansas

2016

Abstract

Recruiters and recruitment materials can signal to job seekers certain aspects of the organization which may affect how attractive the organization appears as a potential employer (signaling theory; Rynes, Bretz, & Gerhart, 1991). Some signals received during recruitment can indicate that social-based inequalities and hierarchies may exist (social dominance theory; Sidanius & Pratto, 1999). It is possible that women might perceive themselves as part of a subordinate group in fields where they are underrepresented, such as the areas of science, technology, engineering, and mathematics (STEM). The current research examines participant gender and the effects of using traditionally feminine words, masculine words, or neutral words in recruitment material on participants' ratings of STEM program attractiveness and perceptions of institutional belonging. Furthermore, one's goal orientation can influence the type of goal one is attracted to and whether it will be adopted; the current research looks at the effects of one's goal orientation and how that is related to the person's efficacy regarding STEM recruitment materials (Elliott & Dweck, 1988). Additionally, a goal orientation intervention was conducted in an attempt to influence participants' situational learning goal orientations and measured efficacy. While the gendered wording of the recruitment material did not influence participants' ratings of attraction and perceived belongingness, women rated the STEM recruitment material as more attractive than men. Additionally, participants' learning goal orientation was found to have a significant influence on their measured efficacy. The results of this research have implications for recruiting female applicants to STEM programs/careers and suggestions for organizational interventions and best practices in order to positively affect job outcomes.

Keywords: recruiting, signaling theory, goal orientation, social dominance theory, STEM

ATTRACTING WOMEN TO STEM PROGRAMS:
THE INFLUENCE OF GOAL-ORIENTATIONS AND
THE USE OF GENDERED WORDING IN RECRUITMENT MATERIALS

by

LESLY R. KROME

B.A., University of Alaska, Anchorage, 2010
M.S., Kansas State University, 2013

A DISSERTATION

submitted in partial fulfillment of the requirements for the degree

DOCTOR OF PHILOSOPHY

Department of Psychological Sciences
College of Arts and Sciences

KANSAS STATE UNIVERSITY
Manhattan, Kansas

2016

Approved by:

Major Professor
Dr. Patrick Knight

Copyright

LESLY R. KROME

2016

Abstract

Recruiters and recruitment materials can signal to job seekers certain aspects of the organization which may affect how attractive the organization appears as a potential employer (signaling theory; Rynes, Bretz, & Gerhart, 1991). Some signals received during recruitment can indicate that social-based inequalities and hierarchies may exist (social dominance theory; Sidanius & Pratto, 1999). It is possible that women might perceive themselves as part of a subordinate group in fields where they are underrepresented, such as the areas of science, technology, engineering, and mathematics (STEM). The current research examines participant gender and the effects of using traditionally feminine words, masculine words, or neutral words in recruitment material on participants' ratings of STEM program attractiveness and perceptions of institutional belonging. Furthermore, one's goal orientation can influence the type of goal one is attracted to and whether it will be adopted; the current research looks at the effects of one's goal orientation and how that is related to the person's efficacy regarding STEM recruitment materials (Elliott & Dweck, 1988). Additionally, a goal orientation intervention was conducted in an attempt to influence participants' situational learning goal orientations and measured efficacy. While the gendered wording of the recruitment material did not influence participants' ratings of attraction and perceived belongingness, women rated the STEM recruitment material as more attractive than men. Additionally, participants' learning goal orientation was found to have a significant influence on their measured efficacy. The results of this research have implications for recruiting female applicants to STEM programs/careers and suggestions for organizational interventions and best practices in order to positively affect job outcomes.

Keywords: recruiting, signaling theory, goal orientation, social dominance theory, STEM

Table of Contents

Acknowledgements.....	viii
Chapter 1 - Recruitment.....	1
Chapter 2 - Goal Orientation.....	5
Chapter 3 - Social Dominance Theory.....	14
Chapter 4 - Gendered Wording.....	20
Chapter 5 - STEM.....	25
Chapter 6 - Experiment One	29
Method	31
Analyses	36
Discussion	39
Chapter 7 - Experiment Two.....	45
Method	47
Analyses	48
Discussion	51
Chapter 8 - Experiment Three.....	56
Method	57
Analyses	61
Discussion	63
Chapter 9 - General Discussion	67
References	72
Appendix A - Variations of the STEM Program Recruitment Material	78
Appendix B - Perceived Program Attractiveness Survey	80
Appendix C - Perceived Institutional Belongingness Survey	81
Appendix D - Demographic Information Form	82
Appendix E - Bem Sex Role Inventory (BSRI; Bem, 1974)	83
Appendix F - Goal Orientation Scale (VandeWalle, 1997)	84
Appendix G - Result-Oriented Efficacy	85
Appendix H - Goal Orientation Training Seminar PowerPoint Slides	86

Appendix I - Experiment 1: Mean ratings of program attractiveness and perceived belongingness by participant sex	90
Appendix J - Experiment 1: Means ratings of program attractiveness and perceived belongingness by wording condition	91
Appendix K - Experiment 2: Mean result-oriented efficacy by goal orientations.....	92
Appendix L - Experiment 3: Mean learning goal orientation score and result-oriented efficacy by condition after data transformation.....	93

Acknowledgements

I wish to thank my parents, Jim and Chadene Krome, for their continued support, love, and encouragement throughout my life and education. They are the most amazing and phenomenal parents; I am so blessed to have them in my life.

I also wish to thank Moises A. Guerrero for his loving support and unshakeable faith in me. I could not ask for a better partner and friend.

Finally, I wish to recognize my wonderful advisor, Dr. Patrick Knight. I appreciate so much all of the excellent guidance and instruction you have provided me with over the years and for helping me to achieve my goals.

Chapter 1 - Recruitment

A key aspect of the selection process during employment is recruiting. In recruitment, an organization works to attract job seekers to apply for work opportunities within the company (Guion, 2011). The most qualified of these individuals are selected to be applicants for the available position(s) and then go through a lengthy process in which they may or may not be hired for an open position. In the process of recruiting there are a multitude of factors that must be considered. Typically, the Human Resources (HR) department or hiring department of an organization will recruit using a specialized recruiter or talent acquisition specialist who is trusted to recruit and possibly hire job seekers who will best meet the needs of the company (Rynes & Cable, 2003). To do this, the recruiter may first need to secure funds from the organization to advertise for the vacant positions, determine the required head-count to fill the vacant positions, and identify the necessary minimum requirements for the positions. The recruiter can then know assess which job seekers best meet those requirements and therefore which job seekers should be recruited to the organization.

However, before all of these activities occur, a recruiter or talent acquisition specialist must be aware of the problem of adverse impact. Adverse impact in selection occurs when members of a legally protected group (e.g., ethnic minorities or women) are proportionately less likely to be hired than the majority group (Guion, 2011; Newman & Lyon, 2009). More specifically, if the selection ratio (proportion of applicants hired) of a certain group is less than 80% of the selection ratio of the group with the largest selection ratio, adverse impact may have occurred; this is referred to as the 4/5 rule. Adverse impact can result in lawsuits and court time, so it behooves an organization to keep a very close eye on their selection procedures to ensure that this does not occur without valid justification (Newman & Lyon, 2009). This is where

recruiting can play an important role in improving the selection process.

By providing a more diverse applicant pool from which to select qualified individuals, recruitment can help avoid the occurrence of adverse impact by selecting applicants from a broader sample of job seekers that may include people from underrepresented (minority) groups. This would involve increasing recruitment efforts, with a special effort being made to attract and bring in qualified applicants from the underrepresented groups that are associated more frequently with having adverse impact. Because there are more minority applicants who can be selected, the likelihood that adverse impact will occur may be decreased. When two applicants are essentially equivalent in the job's qualifications, having the option to select the individual from the protected group can keep adverse impact from occurring during the selection process. Therefore, with strategic selection procedures and tactics, adverse impact may be less likely if there is a qualified pool of applicants to select from, including applicants from typically underrepresented groups.

In addition to being inclusive to all groups and securing a large pool of applicants, recruiters (and recruiting processes) are important in communicating information to job seekers about the organization that they are potentially applying. Much of the personnel selection literature identifies and discusses the importance of the role of the recruiter in applicant job choice and selection (Lievens & Chapman, 2009; Turban, 2001). Recruiters can affect applicants' decisions regarding job positions by influencing the applicants' perceptions of the positions and the organization (Turban, Forret, & Hendrickson, 1998). It follows that recruitment material might also affect the applicants' perceptions of the job and organization; indeed, this is what the literature indicates (Glass & Minnotte, 2010). When an individual is being recruited, he or she is obtaining information about the organization just as the organization

is obtaining information about the possible new recruit (Turban, 2001).

The initial contact between the potential recruit and an organization can influence the individual's attraction to that company and influence whether he or she will decide to maintain contact with that organization (Turban et al., 1998). Recruiters and recruitment materials can signal to the job seeker potential success or failure of the individual within the organization and in that manner influence how attractive the organization is to the person. However, during the initial recruiting period, individuals do not have a complete understanding of the organization and instead only have the information about the organization that they receive from the recruiter or through their own research of the company. Signaling theory (Rynes, Bretz, & Gerhart, 1991) states that individuals will take the information they can obtain through recruitment as a type of cue or an indication of the overall nature of the organization. For instance, Turban (2001) found that "applicants are likely to interpret information about [a] firm as providing 'signals' about what it would be like to work at the firm " (pp.295). The rapport developed during the interview, the demeanor of the recruiter, and the tidiness of the workspace (among other things) may influence an applicant's perceptions of various organizational qualities, such as working environment and conditions. The pieces of information gained during recruitment influences the job seeker's perceptions of the organization and the job or activity; that is, the signals received influence the potential recruit's attraction or aversion to the organization and/or job (Rynes et al., 1991). Following that, the degree to which an applicant expresses attraction to an organization is strongly related to his or her subsequent decision to accept a job offer (Turban, 2001). Therefore, presenting information and signals that attract job seekers to the organization is of utmost importance for a recruiter or talent acquisition specialist.

While an organization does not have in and of itself a "personality," applicants tend to

ascribe personality characteristics to organizations during the application, interview, and hiring process (Lievens & Chapman, 2009). These traits are human in nature and convey the honesty, enthusiasm, excitement, skill-level, etc., that the applicant perceives to be representative of the organization. Applicants who attribute traits to organizations that are more similar to their own personality traits perceive those organizations as more attractive and may be more likely to join that company (Slaughter, Zickar, Highhouse, & Mohr, 2004). This finding could have implications for aspects of the organization other than perceived “personality.” For instance, identifying that a significant proportion of the other individuals in an organization have the same perceived gender as the applicant may increase his or her attraction to the institution in the same way that identifying one’s personality in an organization does. How does an applicant identify his or her gender being present in an organization? One possible method is through the signals received via the recruitment material.

Various cues can signify to the potential applicant whether an organization is one with which he or she wants to be associated. Some of these signals might be influenced by how different opportunities are presented. For instance, manipulations of the recruitment material might make a specific job or organization more attractive to an individual by signaling the individual’s potential success within the organization; this could be due to the fact that the applicant possesses a certain trait or characteristic that he or she believes is valued by the organization. Additionally, there may be personality differences that can impact how an individual might view and be affected by certain signals. These individual differences can provide additional insight regarding how a person perceives and pursues a goal, such as a new recruitment opportunity. For instance, the degree to which different signals are interpreted and responded to during recruitment could be influenced by the person’s goal orientation.

Chapter 2 - Goal Orientation

One personality variable that is of interest in understanding how people respond to recruitment material is goal orientation. Whereas a goal is an internal representation of specific desirable states (involving outcomes, processes, and events), an individual's dispositional goal orientation can heavily influence the goals he or she wishes to achieve and how that person pursues them (Austin & Vancouver, 1996). Indeed, Dweck and Leggett (1988) noted that "[t]he goals individuals are pursuing create the framework within which they interpret and react to events," (pp. 256). Dispositional goal orientation is "the relatively stable pattern of cognition and action that results from the chronic pursuit of particular achievement goals in different situations over time" (Schmidt, Beck, & Gillespie, 2013, p. 323). The origin of the study of goal orientations can be traced back to Nicholls (1984), who in studying achievement motivation identified two different modes through which people tend to evaluate their achievement. Nicholls noted that task mastery is gained through learning and improved by effort. It can then be measured by one's perception of his or her own understanding and mastery of the achievement, or it can be referenced against others having high or low ability with that same achievement (Nicholls, 1984). Nicholls coined the term "ego involvement" to address this latter form of social self-evaluation and "task involvement" to describe the self-referenced mastery evaluation.

In agreement with the previous research, Elliott and Dweck (1988) acknowledged the human pursuit of performance and learning goals, reflecting Nicholls's (1984) ego involvement and task involvement, respectively. The authors also identified two types of goal orientations that can be demonstrated in individuals on the basis of these goals. The first, performance goal orientation (PGO), is when the primary aim of the individual is to gain or maintain positive

evaluations of his or her ability and to avoid obtaining negative judgments of their ability (Elliott & Dweck, 1988). This may be accomplished by seeking ways to demonstrate and validate one's abilities while not discrediting them. Learning goals however, are goals by which the individual attempts to increase his or her ability and/or to master new abilities; subsequently, individuals with this type of goal orientation are termed as having a learning goal orientation (LGO), mastery-goal orientation, or task-specific goal orientation (Payne, Youngcourt, & Beaubien, 2007; Pintrich, 2000; Hernandez, Schultz, Estrada, Woodcock, & Chance, 2013).

While both performance-oriented and learning-oriented goals deal with achievement motivation, the goal orientations associated with these goals have different aims: a person with a performance goal orientation is primarily concerned with appearing competent, whereas an individual with a learning goal orientation seeks to actually increase his or her competence (Dweck & Leggett, 1988; Payne et al., 2007). The reasoning behind one's goal orientation adoption deals primarily with an individual's conception of his or her ability and intelligence. It was hypothesized that individuals who view intelligence and ability as fixed entities are likely to see them as unchangeable and that trying to improve one's ability or intelligence was a wasted effort (entity theory; VandeWalle, Cron, & Slocum, 2001; van Hooft & Noordzij, 2009). Therefore, these individuals are more likely to adopt a performance goal orientation and try to maintain or improve how others perceive their competency. People who view intelligence and their other abilities as malleable see that they are able to improve their competencies and are more apt to adopt a learning goal orientation (incremental theory; VandeWalle et al., 2001; van Hooft & Noordzij, 2009). Therefore, the key factor influencing the adoption of a learning goal orientation is the individual's belief about his or her intelligence and abilities: are they unchangeable or is there the possibility of improving them?

Further research on the topic resulted in the conceptualization of goal orientations into three dimensions: 1. learning goal orientations, 2. performance-approach goal orientations, and 3. performance-avoidance goal orientations (Elliott & Dweck, 1988; Elliot & Harackiewicz, 1996; Payne et al., 2007; VandeWalle, 1997; 2003). Learning goal orientations are defined as “mastery oriented,” with the focus being on gaining proficiency of new tasks, acquiring knowledge, and increasing skills. Because of their belief that intelligence and ability are malleable and can be improved, individuals with learning goal orientations are typically not afraid to try new tasks in which they may not immediately be proficient, but in which they can improve and ultimately master. Performance-approach oriented individuals seek to attain favorable judgments about their abilities by demonstrating competency. However, these individuals may view ability and intelligence as unchangeable and seek to demonstrate their abilities and knowledge in the areas in which they are already competent. Thus, performance-approach oriented people tend to choose tasks they feel comfortable executing and can perform well compared to their peers. Finally, performance-avoidance goal orientations are focused on avoiding unfavorable judgments about abilities and negative comparisons to peers. Comparable to those with performance-approach goal orientations, these individuals also choose tasks that they feel they can execute adequately. However, people possessing performance-avoidance orientations choose these goals so as to avoid gaining undesirable feedback regarding their abilities and intelligence (which they also view as fixed). Therefore, the difference between performance-approach and performance-avoidance goal orientations lies in the objective of gaining positive feedback (approach) or circumventing negative feedback (avoidance). These three goal orientations shape how individuals respond to challenging tasks and how adopting a goal influences not only the behavior of the individual, but the thought processes leading up to a task (in addition to

impacting the performance of that task and subsequent others; VandeWalle, 1997).

Goal orientations have been found to be related to many different antecedents and consequences. Individuals with learning goal orientations have been found to have greater self-efficacy, task interest, positive affect, intrinsic motivation, and tend to exert more effort and persistence in completing tasks (Payne et al., 2007; Pintrich, 2000; Elliott & Dweck, 1988). An example of an individual with a learning goal orientation might be seen in the student who takes a senior-level biology class in his or her sophomore year; although the student may not be certain he or she will get top marks, the student is interested in increasing his or her knowledge in biology and thinks it is beneficial to be challenged with a difficult but informative course. Under the revised goal orientation model, performance-approach goal orientations (particularly when coupled with learning goals) are also associated with adaptive outcomes, such as an increase in performance (e.g., a student being competitive and trying to perform a task better than his or her peers). However, the research regarding the adaptive versus maladaptive nature of performance-approach goal orientations is mixed. Whereas an individual with a learning goal orientation may be intrinsically motivated to achieve a goal, someone with a performance-approach goal orientation will be performing the task for peer approval. Finally, performance-avoidance goal orientations are often associated with maladaptive outcomes, such as negative affect, learned helplessness, avoidance of challenges, and/or deterioration in performance (e.g., a student refuses to participate in tasks that are novel to him or her for fear of failure).

Regarding gender differences, goal orientation research has shown varying results. For instance, a study regarding students' goal orientations reported that there were no observed differences between men and women in terms of achievement (learning) goal orientations (Rashidi & Javanmardi, 2012), but a different study on students reported that women scored

higher on the learning goal orientation dimension (Anderson & Dixon, 2009). Some research indicates that men may be more likely to be performance goal oriented due to the ego aspect surrounding this orientation type (Roeser, Midgley, & Urdan, 1996). However, conclusions regarding gender differences in goal orientation research remain inconsistent.

Despite the different categorizations, the three dimensions of goal orientations are not necessarily mutually exclusive. In some instances, learning and performance goals can be held concurrently; an example of this would be when goal orientations are influenced situationally and different goal orientations are activated simultaneously for a specific task (Pintrich, 2000). Goal orientation has been researched in various contexts and a substantial amount of evidence can be found supporting the existence of a situational dimension of goal orientation.

Manipulations of contextual factors (e.g., the provision of competitive reward structures, the pervasiveness of normative information, and the use of evaluative feedback) can impact the type of goals adopted by research participants in a given situation (Button, Mathieu, & Zajac, 1996). Subsequently, it was proposed that goal orientation is a semi-stable personality characteristic and that it can be affected by situational factors (Button et al., 1996). An individual may have the disposition to adopt a particular goal orientation when confronted with a challenge, but contextual factors may alter his or her response patterns. The observed situational goal orientation dimension ran contrary to the original belief that goal orientations were based on the individual's implicit theory of his or her ability/intelligence and therefore were fairly inflexible (Dweck & Leggett, 1988). Instead, what this finding suggests is that situational goal orientation can be influenced and altered, opening up the concept of goal orientations to intervention.

A goal orientation intervention was conducted by van Hooft and Noordzij (2009) on a sample of unemployed job seekers. The researchers focused on improving participants' general

framing, providing an introduction to and examples of the goal orientation frameworks, explaining the theory, having participants practice goal-setting, providing feedback to participants, and assigning out-of-class homework. After the situational training of learning goals, the researchers found that unemployed job seekers had a better job search process, increased job search intentions and enacted behaviors, and higher likelihood of reemployment (van Hooft & Noordzij, 2009). Not only can one's situational goal orientation be influenced by training, but the effects are orthogonal to the individual's dispositional goal orientation. That is, people can hold a situationally-influenced goal orientation (e.g., learning goal orientation) via intervention and/or training and at the same time have a separate dispositional goal orientation (e.g., performance-approach goal orientation) that he or she naturally refers to. This finding indicates that how individuals adopt and pursue goals can be influenced; this information may be valuable to organizations trying to recruit specific individuals.

Situational goal orientations may be better understood within the context of achievement motivation. In 1997, Albert Bandura proposed the self-efficacy theory, which is a social-cognitive model of motivation focused on an individual's perception of his or her effectiveness, worth, and value. Plainly stated, self-efficacy is a belief people hold about themselves. Self-efficacy refers to "individuals' confidence in their ability to organize and execute a given course of action to solve a problem or accomplish a task" (Eccles & Wigfield, 2002, p. 110). Within Bandura's theory, there was a distinction between outcome expectancy and efficacy expectancy: outcome expectancy referred to the belief a person might have that a specific behavior is tied to a specific outcome, whereas efficacy expectancy referred to the belief a person might have regarding his or her ability to actually perform the specific behavior in order to achieve the outcome. Both factors are important, as a person might believe that a behavior is tied to an

outcome (outcome expectancy), but this same person fails to believe he or she can reach the outcome due to his or her inability to perform the behavior (efficacy expectancy). Thus, efficacy and outcome expectancies are important factors involved in goal setting, task-persistence, effort expenditure, and adoption of activities (Bandura, 1997; Eccles & Wigfield, 2002).

The crux, then, of one's situational goal orientation adoption may be viewed as an individual's efficacy and outcome expectancies. Support for this supposition can be offered from the student-based research conducted by Schnelle, Brandstätter, and Knöpfel (2010), who found that outcome expectancy mediated the relationship between the adoption of performance-avoidance or performance-approach goals and participants' perceived resources. Those students with fewer resources reported lower outcome expectancy and were more likely to adopt performance-avoidance goals. This study and others, as well as the body of achievement motivation research, can help form predictions regarding situational goal orientation adoption.

There are several different motivations an individual may have to adopt a goal (orientation) based on one's efficacy and outcome expectancies (here after collectively referred to as "result-oriented efficacy"). For an individual with a learning-goal orientation, result-oriented efficacy may not be the critical factor in the determination of whether he or she will adopt a goal; the individual may simply view the goal (whether perceived to be challenging or not) as an opportunity to improve upon his or her skills and knowledge. However, for performance-oriented individuals, the perception of the possible outcome associated with adopting a goal may be quite important. Individuals with performance-approach goal orientations may be eager to adopt a goal if they perceive they can adequately achieve the goal and gain positive evaluation from peers. Alternatively, individuals with performance-avoidance goal orientations may view possible failure as a signal to not adopt the goal, for fear of negative

comparison. The question that remains is: what signals the possible success or failure of adopting a goal?

A recent online longitudinal study investigated the sustained optimal motivation of STEM (Science, Technology, Engineering, and Mathematics) program minority students of African-American and Hispanic ethnicities across the United States (Hernandez et al., 2013). Over the course of three academic years, the researchers found that dispositional task (learning) goals were positively correlated to students' cumulative GPA. Through structural equation modeling the researchers found that performance-avoidance goals influenced the students' rate of attrition from the STEM program. The researchers accomplished this by looking at students with relatively high, average, and low levels of initial performance-avoidance goals and then determined the predicted probability of their continued perseverance in the STEM program. There was an 89% probability for persistence in the STEM program for students with higher initial performance-avoidance goals whereas those with lower initial performance-avoidance goals had a 96% probability of continuing the program (students with average levels of initial performance-approach goals were predicted to have a 93% likelihood to continue the program). The researchers concluded that the students with higher initial performance-avoidance goals would be more likely to leave the STEM program entirely.

This study has profound importance for understanding how an individual's goal orientation is related to that person's performance. However, what is not addressed is whether goal orientations impact how likely a person is to consider the program in the first place. Can a person's dispositional or situational goal orientation make the individual more receptive to recruiting material (because of the degree of result-oriented efficacy accompanying that orientation)? If so, could the individual's situational goal orientation be influenced by signaling

potential success and lead him or her to interpret the recruitment opportunity as a more desirable option?

As discussed, an individual's dispositional and situational goal orientation is one mechanism by which signals from recruitment materials may evoke different responses regarding a recruiting opportunity. Goal orientation influences are in reaction to the recruiting stimuli; the individual may select a situational learning goal orientation, a situational performance goal orientation, or fall back into his/her default dispositional goal orientation response pattern, in response to the stimuli. In this way, the individual can set goals according to his or her perception of how likely it is that he or she will be successful or will fail (according to one's level of result-oriented efficacy). Therefore, what must be determined is what actually signals the potential failure and/or success in an organization or program in the first place. What recruitment material indicates that someone will not be successful, and why does this happen? The answer might be brought to light by considering social dominance theory.

Chapter 3 - Social Dominance Theory

Whereas goal orientations can explain an individual's responsive action to signals obtained from recruitment material, social dominance theory may explain how an individual perceives and interprets those signals. Social dominance theory contends that people tend to segregate themselves according to a group-based social hierarchy within formal organizations (Sidanius, Pratto, Martin & Stallworth, 1991). By possessing a physical or social characteristic (or multiple characteristics) of the dominant group, individuals are able to separate themselves from the less-desirable group (here after referred to as the “negatively-referenced” group or “subordinate” group; Sidanius & Pratto, 1999). Typically there are three stratification systems that can be seen in group-based social hierarchies: an age system, a gender system (e.g., patriarchy), and an arbitrary-set system (e.g., racism). In a patriarchy system, the male members of the group assume a disproportionate amount of social and political power whereas in the arbitrary-set system, ethnicity or perhaps religion may be the discriminating variable.

This segregation of the organization forms a caste system, with a dominant group at the top of the hierarchy and a negatively-referenced group at the bottom (Sidanius & Pratto, 2011). The dominant group possesses greater positive social value (e.g., higher social standing and greater wealth) and secures the majority of the best resources; the members of the minority group are given a disproportionate share of leftover resources and are perceived to possess lower social value, such as having less power and status (Sidanius & Pratto, 1999). Additionally, members of the dominant group maintain security and positive group identity by comparing themselves favorably to members of the negatively-referenced group. In this way, the dominant group does not allow for a positive social identity of the negatively-referenced group, as this could cause that group to demand more power, prestige, and social value, thus disrupting the hierarchy (Sidanius

et al., 1991; Turner, Brown, & Tajfel, 1979). Because negative self-images perpetuate deference to the dominant group and reinforce the hierarchy, they are socially debilitating for the negatively-referenced group (Sidanius et al., 1991).

The dominant group maintains control over the negatively-referenced group by perpetuating the idea that they are superior (e.g., more moral, fair, worthy, etc.); these are called “hierarchy-legitimizing myths,” often referred to simply as legitimizing myths (Pratto, Sidanius, Stallworth, & Malle, 1994). Legitimizing myths are attitudes, beliefs, and values that support the social hierarchy by providing justification for the unequal allocation of social value within the organization (Sidanius & Pratto, 1999). There are two distinguishing characteristics of legitimizing myths, one being functional type and the other being potency. A legitimizing myth’s functional type addresses the direction of the legitimizing myth, as supporting group-based social inequality or supporting group-based social equality. Hierarchy-enhancing legitimizing myths (e.g., sexism) create and support group-based social inequality whereas hierarchy-attenuating legitimizing myths (e.g., feminism) create and support group-based social equality. How effective a legitimizing myth is at promoting, supporting, or hindering a group-based social hierarchy is the degree of potency the legitimizing myth is seen to possess.

There are four factors identified that contribute to a legitimizing myth’s potency: consensus, embeddedness, certainty, and mediational strength. Consensus refers to how commonly shared the discerning social ideologies and representations are within the hierarchy. Consensus more specifically looks at how shared the hierarchy enhancing- and hierarchy attenuating-legitimizing myths are between the dominant and negatively-referenced groups. Embeddedness refers to how strongly endorsed and extant the legitimizing myth is within other aspects of culture, such as religion and public social norms. How much truth, scientific

confidence, and moral or religious support there is for a legitimizing myth is considered the amount of certainty of the legitimizing myth. And finally, mediational strength refers to how well a legitimizing myth acts as “a link between the desire to establish and maintain group-based social hierarchy on the one hand and [the] endorsement of hierarchy enhancing or hierarchy attenuating social policies on the other hand” (Sidanius & Pratto, 1999, p. 48). Hierarchy enhancing and hierarchy attenuating forces are thought to be factors that help to maintain hierarchical equilibrium, that is, a stable point of group-based hierarchy within a social structure, which maintains the hierarchy over time. It is at this point that the social hierarchy is considered legitimate and poses no morally or structurally debilitating threat that may result in the collapse of the organization.

The hierarchy is considered legitimate to all organizational members as long as the negatively-referenced group members accept the legitimizing myths and negative self-images placed upon them by the dominant group (Sidanius et al., 1991). Additionally, some individuals may be more inclined to support group-based social hierarchies and the legitimizing myths perpetuating these hierarchies. This refers to an individual’s social dominance orientation (SDO), or the person’s “generalized orientation toward group-based social hierarchy” (Sidanius & Pratto, 1999, p. 39). Essentially, social dominance orientation reflects how accepting an individual is of the social-based hierarchy and how strongly he or she desires to maintain the continued subjugation of the negatively-referenced group by the dominant group.

There are several factors that can influence an individual’s social dominance orientation, some of which are more obvious than others. First, and most intuitive, is the individual’s membership in the dominant or negatively-referenced group. Individuals who identify with the dominant group will have a higher social dominance orientation than members of the negatively-

referenced group. Individual differences can also affect social dominance orientation, specifically one's degree of empathy: the more empathetic an individual is the less likely it is that that person will have a strong social dominance orientation. Finally, gender greatly influences one's social dominance orientation. Men are more likely to have higher levels of social dominance orientation (greater out-group hostility and an affinity for group-based dominance) than women, most likely due to the universal dominance and power held by men in social systems across human history (Sidanius & Pratto, 2011; Dambrun, Duarte, & Guimond, 2004). This proposition—that men have higher social dominance than women (all other things being equal)—is known as the invariance hypothesis (Sidanius & Pratto, 2011).

As previously stated, members of organizations maintain the social hierarchy by controlling major social resources and how those resources are allocated to different groups according to social value (Sidanius et al., 1991; Sidanius & Pratto, 1999). This occurs because hierarchy-enhancing ideologies exist in the organization that, “justify the establishment and maintenance of group-based social inequality...” (Sidanius & Pratto, 2011, p. 419). This allows the dominant group to maintain an advantage over the negatively-referenced group. There are three processes that contribute to the maintenance of this ideology: aggregated individual discrimination, aggregated institutional discrimination, and behavioral asymmetry (Sidanius & Pratto, 1999). The unequal division of social status and resources more readily allows for discriminatory behavior against the negatively-referenced group to occur. The hierarchy legitimizing myths previously discussed help regulate these processes.

Aggregate individual discrimination is identified as an act of discrimination by one person against another repeated over time by multiple parties (Sidanius & Pratto, 1999). These acts of discrimination can be daily or periodic and can be either subtle or overt. Over the course

of days, weeks, and years, they can be highly influential in differentiating social groups and maintaining a clear power distinction between them. Aggregate institutional discrimination, on the other hand, is discrimination that is solidly in place within the organization's policies and procedures. Institutions may be private or public and the discrimination may be either deliberate (overt and consciously done) or unintended and more covert. Institutional discrimination can be identified when the decisions made by the organization result in a "disproportionate allocation of positive and negative social value across the social status hierarchy, all other factors being equal" (Sidanius & Pratto, 1999, p. 41).

Behavioral asymmetry occurs when members of the negatively-referenced group behave in a manner that is not beneficial to their group, whereas members of the dominant group take actions that help themselves and their group (Sidanius & Pratto, 2011). In this way, members of the negatively-referenced group actively participate in their own suppression through their cooperation with the system of group-based dominance (Sidanius & Pratto, 1999). Four subcategories of behavior asymmetry have been identified: asymmetrical in-group bias, out-group favoritism (deference), self-debilitation, and ideological asymmetry. Most individuals will always favor members of the group to which they belong; however, asymmetrical in-group bias occurs when the in-group favors its members far more than the out-group favors its members. Out-group favoritism, on the other hand, occurs when members of the negatively-referenced group actually favor members of the dominant group over their own group. Self-debilitation occurs when members of the negatively-referenced group engage in self-destructive behaviors at a greater rate than the dominant group. These self-debilitating behaviors are generally consistent with the negative stereotypes associated with the negatively-referenced group, and in fact, may be a result of the negative stereotype in the first place, as the negatively-referenced group

member may draw upon that stereotype as a behavioral schema (in this way, self-debilitation is similar to the self-fulfilling prophecy; Sidanius & Pratto, 1999). Finally, there is ideological asymmetry, which posits that the dominant group will be more strongly driven by social dominance values (in terms of preference for policies and holding social attitudes that support the hierarchy) than the negatively-referenced group. It comes as no surprise that the dominant group will have greater social dominance orientation preferences than the group being subjugated.

The longer the dominant group maintains control over the values and culture of the organization, the longer this group is able to perpetuate the negative self-image of the subordinate group (Sidanius et al., 1991). The inequalities among the dominant and negatively-referenced groups can be strengthened through mechanisms that may already exist in the organization. These mechanisms may be so highly ingrained into the framework of the organization that they are not considered to be sources of discrimination against certain groups. One such institutional mechanism that may be perpetuating group discrimination, specifically between men and women, is gendered wording in job advertisements.

Chapter 4 - Gendered Wording

Some research suggests that the wording or phrasing of a particular job description can make it more attractive to either men or women (Gaucher, Friesen, & Kay, 2011). This could be due to the differences between how men and women use language, which has been documented in research. Women tend to use more communal language than men and reference social and emotional words more frequently (Hollander & Abelson, 2014). For instance, women might use words such as “cooperation,” “sensitive,” “dependable,” and “supportive” more often than men (Gaucher et al., 2011; Hollander & Abelson, 2014). Also, gender stereotypes exist in which women are perceived to be more interpersonally oriented and men are more often associated with leadership and action (Eagly & Karau, 2002). The role congruity theory proposed by Eagly and Karau (2002) discusses how this stereotype can be damaging, particularly when people act against the stereotype. This is often the case for female leaders who must usually assume a dominant orientation in order to be successful in their position of power. When others observe that the female leader is assuming what is viewed as a more traditionally masculine orientation, the incongruence between the leader’s perceived gender and her actions, words, and disposition may result in prejudice.

Gaucher et al. (2011) investigated gendered wording in job advertisements and how the masculinity/femininity of a job description made that position more or less desirable to female samples. In their first study, the researchers wished to determine if gendered wording differences in job advertisements existed. To do this, the researchers randomly sampled 493 online job advertisements that were for either a typically male-dominant or female-dominant occupation, as identified by the proportion of men and women within that occupation according to the U.S. Department of Labor. Job advertisements were reviewed for a total of 11 job

occupations on the leading Canadian job-search websites “monster.ca” and “workopolis.com.” Of the 11 job types, the typically male-dominant occupations consisted of plumber, electrician, mechanic, engineer, security guard, and computer programmer; alternatively, the traditionally female-dominant occupations were administrative assistant, early childhood educator, registered nurse, bookkeeper and human resources professional (Gaucher et al., 2011).

These advertisements were then coded for their use of traditionally masculine or feminine words. Masculine words included words such as “individualistic,” “ambitious,” “assertive,” and “competitive” whereas feminine words included “committed,” “supported,” “compassionate,” and “understanding,” among others. The job advertisements were then scored on the mean percentage of traditionally masculine and feminine words present in the advertisement. The authors found that the job advertisements they reviewed used significantly more traditionally masculine words (.83%) than feminine words (.63%) overall. Additionally, more of the gendered wording was found in male-dominant jobs (.77%) than female-dominant jobs (.69%). After looking at the main effects, the authors tested the gendered wording by job type interaction and found that traditionally masculine words were more likely to be present in advertisements for male-dominant jobs (.97%) than for female-dominant jobs (.70%). However, as far as the frequency of traditionally feminine words were concerned, there was no significant difference in their advertisement usage between the male-dominant (.57%) and female-dominant (.67%) jobs. These findings were replicated in a second study, which used a sample of university job advertisements.

Gaucher et al. (2011) then manipulated the masculinity and femininity of words in job advertisements in order to study the effect they had on perceptions of gender diversity. This was done for a wide variety of jobs, both traditionally masculine (e.g., plumber) and traditionally

feminine (e.g., nurse), as well as more gender-neutral occupations (e.g., sales clerk). As a measure of diversity, participants were asked if they thought that more men or more women worked the jobs listed in the job descriptions. It was found that job descriptions using traditionally masculine words were viewed to have more men working in them than jobs advertised using traditionally feminine words.

The same experimental design was utilized in two additional studies in which the researchers attempted to determine if the masculine wording in a job description decreased women's interest in the position. However, rather than ask about the perceived number of men and women in the position, participants were asked if they were interested in working in that particular job and how well they felt they would fit in. After controlling for the main effect of job type, it was determined that women found masculinely worded jobs to be less appealing than femininely worded jobs, regardless of whether the job was traditionally male-dominant or female-dominant. This was not due to women's perceptions regarding their ability to perform the job; the gendered wording was not related to participants' measured perceptions of job-related efficacy. Instead, it was women's perceptions of anticipated belongingness to the organization that appeared to influence their attraction to the job advertisement. Women reported that they were more likely to feel they would have a sense of belonging in the occupations that were less masculinely worded. From this research it can be understood that, when recruiting women, gendered wording may be one way to indicate/signal their belongingness.

However, in trying to be inclusive to women, the threat of femininely-worded job advertisements that alienated male applicants had to be reviewed. There could be aversive effects of femininely worded job advertisements which could negatively influence how men

perceive those job advertisements. For instance, the potential exists of estranging male applicants to certain jobs by purposely creating advertisements using more of the traditionally feminine words. While the abundance of feminine words signifies belonging to women, it could signify to men that they do not belong or may decrease their interest in the position if they perceive they will not be a part of the dominant group. In their study of gendered wording, Gaucher et al. (2011) found that “[m]en were only slightly more likely to find the masculinely worded jobs more appealing than femininely worded jobs, and there was no effect of gendered wording on men’s feelings of belongingness within the occupation” (pp. 119). However, the potential aversive effects of gendered wording in job advertisements must be considered and any research involving gendered wording should be looking at the effects of the wording on both genders, regardless of the target population.

The finding that women reported a greater sense of belonging in the occupations that were femininely worded corresponds with what the social dominance theory would suggest about how individuals group themselves in accordance to a social hierarchy. The results suggest that when women perceive a masculine culture or advertisement, they feel segregated from the dominant group and therefore may be less likely to pursue opportunities in that job (or perhaps even in that academic field). If it was indicated to women that they were not separate or different from the majority of the organization or the academic field, this may result in less hesitance to enter that particular job or academic field.

From a recruiter’s perspective, perceived group discrimination can provide a potentially serious problem when trying to get individuals from underrepresented groups to apply for positions within an organization. If the wording of the job advertisement signifies subordinate group discrimination or favoritism of the dominant group, the position will be less appealing to

potential applicants in the negatively-referenced group and they will be less likely to apply, which will result in a smaller and less diverse pool of applicants. Additionally, this type of job advertisement can signify a lack of institutional belongingness to the potential applicant and make him or her less likely to pursue that opportunity. To combat this problem, a recruiter might purposely word the job advertisement in a manner that would not signify subordinate group discrimination or the favoritism of the dominant group and would appear more appealing to the subordinate applicant. At the same time, the job advertisement needs to be such that it does not alienate or repel the dominant group. As a recruiting tactic, gendered wording in job descriptions might be especially helpful in attracting women to STEM programs, STEM being a field of study and industry in which women are an underrepresented minority group.

Chapter 5 - STEM

Recruiting underrepresented or minority groups can be very challenging for some areas of work or study, such as STEM programs or careers. The Economics and Statistics Administration (ESA) identifies 50 different occupational codes in its list of STEM fields; these codes are part of the U.S. Federal government's Standard Occupational Classification (SOC) system, the purpose of which is to classify workers into occupational categories for research purposes (2018 SOC Revision Process; n.d.). The list of STEM occupational codes are then subdivided into four categories: computer and math, engineering and surveying, physical and life sciences, and STEM managerial occupations (Beede, Julian, Langdon, McKittrick, Khan, & Doms, 2011). The ESA also lists professional/technical support occupations in the fields of computer science and math, engineering, and life and physical sciences under the category of STEM jobs. In 2009, 5.3% of the workforce filled these jobs, an estimated 7.4 million workers (Beede et al., 2011).

However, these jobs and academic programs are typically highly deficient in two particular groups of workers: women and ethnic minorities (Carnevale, Smith, & Melton, 2011; Hernandez et al., 2013; Leaper et al., 2010; U.S. Department of Commerce, Economics and Statistics Administration and Executive Office of the President, 2011). African-American and Latino workers are especially underrepresented in the field and ethnic minorities who are women even more so. Carnevale, Smith, & Melton (2011) reported that while women comprise almost half (48%) of the work force in non-STEM jobs, only 23% of workers in STEM are women. A plethora of research studies have been conducted to determine why this sex difference exists, and whether there is something about STEM academic programs and careers that makes them less attractive to women. Sex-role attitudes, academic achievement motivation, gender identity,

cognitive bias, stereotype threat, peer relations, high school experiences, social networking, and spatial abilities are only some of the constructs that have been examined to help understand the differences between men and women in STEM program involvement (Benbow, 2012; Glass & Minnotte, 2010; Leaper et al., 2012, Miller & Halpern, 2012).

Regardless of the possible reasons why STEM academic programs are lower in popularity among women, hiring organizations must continually attempt to recruit women into STEM careers or face the consequence of adverse impact during recruitment and selection. Recruiting more female applicants increases the probability of finding qualified women to be contenders for open positions. This increases the probability that a female applicant will be selected and therefore the likelihood of adverse impact occurring decreases. This is very important for STEM academic programs and occupations since the proportion of women in the STEM fields remains very low (Glass & Minnotte, 2010; Leaper et al., 2012). For instance, between the years 1998 and 2008, women earned less than half of all bachelor's degrees in computer sciences, physical sciences, engineering, and mathematics; specifically in the engineering and computer sciences fields, women made up less than 20% of all degree-holders (U.S. Department of Commerce, Economics and Statistics Administration and Executive Office of the President, 2011).

Better attracting women to STEM and increasing the participation of women in those academic and instructional programs can generate a greater base of STEM-trained specialists, adding greatly to the field and potential applicant pools. Glass and Minnotte (2010) found that when more women applied for STEM faculty jobs, a greater number of women were in the semifinalist and finalist positions for those positions. While only 15% of the applicants in the study were women, over one third of the job offers were presented to a female applicant. While

this finding may be due to the successful implementation of affirmative action policies within these organizations, what could alternatively be concluded is that female applicants for STEM job positions are not only as qualified as their male counterparts, but may perform better during interviews than male applicants. If more qualified women applied to STEM job positions and subsequently were successful in the application process and hired, the gender discrepancy currently in the field would be reduced. However, women first must be attracted to STEM academic programs so that qualified female workers can be trained; this again indicates that recruitment plays a vital part in closing the gender gap in the STEM fields.

In addition to enhancing the overall quality and diversity of the STEM workforce, women being hired into STEM careers can also greatly benefit women in general as they enter into higher-status jobs and fields of study. The glass ceiling effect refers to the common general finding that women and ethnic minorities have greater disadvantages at the top of an organizational hierarchy than at lower levels of the hierarchy (Cotter, Hermesen, Ovadia, & Vanneman, 2001; Dambrun, Duarte, & Guimond, 2004; Davies-Netzley, 1998). Cotter et al. (2001) describe four criteria that indicate this inequality has occurred: a gender or racial group difference that is (1) unexplained by job-relevant characteristics of the workers, (2) occurring at increasing levels as the workers move up an organizational hierarchy, (3) affecting the workers' chances of advancement, and (4) increasing over the span of the workers' careers. Encouraging women into STEM careers may help address the glass ceiling effect by normalizing the female workforce in these fields and increasing the chances that qualified women will be promoted to positions of power. At the very least, encouraging women to enter STEM disciplines can get women into jobs with power and financial stability; indeed, degree-holding women (including those with undergraduate degrees other than STEM related fields) can earn 20% more money in

STEM jobs than elsewhere (Beede et al., 2011). As of 2009, there were 2.5 million women holding STEM-related college degrees compared to 6.7 million men (Beede et al., 2011). This large disparity brings up many questions, the most prominent being: how can more women be brought into STEM?

Chapter 6 - Experiment One

Due to the current underrepresentation of women in STEM disciplines, a STEM field organization or academic institution may signal potential failure to female applicants and thus appear as an unattractive option, resulting in women's decreased attraction to that organization or institution. This lack of female group membership may signal to women that they do not belong within the organization/discipline or that they will be part of the negatively-referenced group in a social hierarchy; women will therefore be less likely to wish to join that particular institution. This can obviously have a negative effect on recruitment efforts as the perception of being in a subordinate group may turn women off of STEM academic programs and careers. One way to try to change the perception that women will be at the bottom of a social hierarchy is by increasing their perceived sense of belonging to the STEM field or organization through the use of gendered wording in recruitment materials. By using traditionally feminine words in the recruitment advertisements, organizations can signal to women that they will not be negatively-referenced and that they belong in the organization. By doing this, more women should be attracted to STEM programs and careers, ultimately increasing their presence in these positions (which in turn may signal a greater sense of belongingness to outside potential recruits in the future).

Therefore, the first study manipulated the wording of STEM program recruitment material in order to determine if the type of wording used (traditionally masculine, traditionally feminine, or gender-neutral) influenced how female participants rated the STEM program recruitment material in attractiveness and perceived institutional belongingness to the organization or academic program. The following was hypothesized:

H1: Female participants will find STEM program material advertised using a)

traditionally feminine words to be most attractive, b) traditionally masculine words to be least attractive, and c) gender-neutral words to be less attractive than traditionally feminine worded advertisements, but more attractive than traditionally masculine worded advertisements.

H2: Female participants will perceive a) the greatest sense of institutional belongingness from STEM program material advertised using traditionally feminine words, b) the least sense of institutional belongingness from STEM program material advertised using traditionally masculine words, and c) less institutional belongingness from STEM program material advertised using gender-neutral words than the traditionally feminine words, but more institutional belongingness than STEM program material advertised using traditionally masculine words.

As men are typically members of the dominant group in most social hierarchies, their attraction to specific job advertisements may be less influenced by factors pertaining to the recruitment material (Sidanius & Pratto, 2011). Previous research seems to support this supposition, as Gaucher et al. (2011) remarked on how gendered wording in job advertisements had no significant effect on men's perceptions of institutional belongingness. The researchers also found that there was only a slight increase in job appeal for men when traditionally masculine words were used in the job advertisement (compared to the traditionally feminine words). Therefore, attempts to increase men's perceptions of institutional belongingness and attraction through strategic recruiting materials may be ineffective.

In human history, men have at all times held universal power in almost all social systems that have ever existed (Sidanius & Pratto, 2011). As such, the perception of belongingness and

some degree of social dominance is likely embedded in the male population. Because of this, it is likely that male applicants will already perceive institutional belongingness (being that they are a dominant part of the social hierarchy) and their attraction to the STEM program would not be highly influenced by the job advertisement's wording since those signals from the recruitment material would not be salient to the male applicant (as he would not be looking for clues of belonging). Therefore, it was hypothesized that:

H3: Male participants will find STEM program material advertised using a) traditionally feminine words, b) traditionally masculine words, and c) gender-neutral words to be equally attractive.

H4: Male participants will perceive the same degree of institutional belongingness from STEM program material advertised using a) traditionally feminine words, b) traditionally masculine words, and c) gender-neutral words.

Method

Participants

A total of 100 male and 79 female Kansas State University undergraduate students were recruited over the course of the spring 2015 semester from the on-line SONA research introductory psychology participant pool. The participant pool consisted of mostly male (56%), Caucasian (70.1%), freshman (56%) students and the mean age of the sample was 21 years of age. All participants were treated in accordance with APA ethical guidelines in addition to Kansas State University's IRB guidelines and thoroughly debriefed after their participation in the study.

Materials

The current study required three variations (masculine, feminine, and gender-neutral) of

online STEM recruiting material (Appendix A). The STEM program recruitment material was loosely based on the Kansas State University GROW Program, which is designed for adolescent girls and attempts to engage them in the STEM field of academic study. The recruitment material from the GROW Program, obtained from the KSU website (<http://www.k-state.edu/grow/>), has been modified for this experiment. The determination of masculine and feminine words came from the 2011 Gaucher et al. article (the author's List of Masculine and Feminine Words is found in Appendix A of Gaucher et al., 2011). The words in this appendix were consistent with the words in other language-coding research examining gender differences. This includes research conducted by Newman, Groom, Handelman, and Pennebaker (2008), Rudman and Kilianski (2000), Bem (1974), and Hoffman and Hurst (1990).

An evaluation form measuring program attractiveness was required (Appendix B). This evaluation form was initially piloted in the spring semester of 2014 on a sample of 84 Kansas State University students recruited using the online SONA database. A list of 12 potential scale items was created, and a 6-point Likert scale (1 = Strongly Disagree; 6 = Strongly Agree) allowed participants to rate their response to the statements measuring perceived program attractiveness. After data was collected, the participant responses were entered into a Principle Component Analysis (PCA) to reduce the observed variables while extracting the components explaining the most variance. By conducting a PCA, the important factors that underlie the items can be understood and aggregated, possibly resulting in dimension reduction. The PCA distributes the variance into orthogonal components and the components explain the variance in each variable. This results in a more efficient and effective scale.

Standards for conducting an exploratory factor analysis (EFA) were met, including a satisfactory Kaiser-Meyer-Olkin value ($KMO = .80$), a correlation matrix with coefficients of .3

or higher, and a statistically significant Bartlett's Test of Sphericity ($\chi^2(36) = 402.52, p < .001$). Nine of the 12 items did not have loadings greater than .50 on multiple components in PCA, indicating that these variables were not cross-loaded. Therefore, these nine items were retained while the other three items were discarded from the scale. The items were entered into an Exploratory Factor Analysis (EFA) using maximum likelihood factoring and an oblimin rotation to ease interpretation of the factor loadings. It was determined that two factors had eigenvalues greater than 1 explaining 38.95% of the common variance (Factor 1: Program Attractiveness) and 21.33% of the common variance (Factor 2: Future Learning). A scale reliability analysis was conducted after data collection for the current study and the program attractiveness scale had an acceptable internal consistency reliability of .84, as measured by its Cronbach alpha coefficient.

Several studies (e.g., Cook, Purdie-Vaughns, Garcia, & Cohen, 2012; Gaucher et al., 2011) that look at belongingness have modified Walton and Cohen's (2007) Belongingness Scale, which comes from the authors' research regarding identity, belonging, and achievement. The current study followed this precedent by generating nine statements intended to determine the participants' perceptions of institutional belongingness (see Appendix C). This measure, which also utilizes a 6-point Likert scale (1 = Strongly Disagree; 6 = Strongly Agree), includes various statements regarding the participants' perceived social belongingness and potential to succeed in the STEM program based on their perceptions of the recruitment material. The Cronbach alpha coefficient for this measure was .83, which indicated satisfactory internal consistency.

In addition to the rating of program attractiveness and sense of institutional belongingness, the evaluation form also featured demographic questions (Appendix D). These

questions included age, sex, ethnicity, major or intended major, current class status (freshman, sophomore, junior, senior, other), and GPA. Participants were also asked to list their highest level of completed English, mathematics, and science courses. This information was collected for later review to determine if any of these variables might be potential covariates. However, as there were no significant indicators that these factors were covariates, for the analysis of the first experiment, it was determined that only participant measures of masculinity and femininity would need to be controlled for, as gender-based research often controls for these factors.

Participants assessed their measures of masculinity and femininity (potential covariates) using the BSRI, or Bem Sex-Role Inventory (Bem, 1974; Appendix E). This instrument consists of a list of 60 personality traits that participants rated in terms of how closely the traits matched their own personality; 20 of the traits were determined to be masculine, 20 were determined to be feminine, and 20 were gender neutral (distractor items). The 7-point Likert scale ranged from one (never or almost never true) to seven (always or almost always true), with the numbers “3,” “4,” and “5” indicating neutral agreement. After taking the survey, participants were then scored in terms of their mean ratings of masculinity and femininity. The measure is normative, so to be classified as masculine or feminine, the participant had to score above the median in one category and below the median in the other. To be classified as androgynous, the participant had to score above the median in both masculine and feminine traits. An undifferentiated classification would result from scoring below the median in both masculine and feminine traits. However, the latter two classification averages (androgyny and undifferentiated) were not needed for the current study, as these categories were not potential covariates. Therefore, only participants’ averages for masculinity and femininity were utilized for the analyses. The Cronbach alpha coefficient for the BSRI was .89.

Procedure

First a manipulation check was conducted using the STEM recruitment material to ensure that the manipulation of gendered wording throughout the advertisement was strong enough to signal gender differences. The neutral STEM advertisement was emailed to 20 individuals known to the experimenter and was also posted to social media. Individuals being surveyed were then asked to rate if the statement was masculine, feminine, or gender-neutral. Almost all of those surveyed responded that the statement was gender-neutral, though two participants stated that the ad was masculine. However, the qualitative data that was retrieved through the survey shed light on why some of the participants thought the ad was masculine: “Fields such as science, technology, engineering, and mathematics are typically considered male careers.” Therefore, the manipulation was determined to be successfully neutral for that advertisement.

The feminine condition was posted to a different site on the social media platform and individuals were asked to respond to whether the statement was masculine, feminine, or gender-neutral. Almost all 20 respondents stated that the advertisement was gender-neutral. The STEM recruitment material was adjusted to increase the number of traditionally-feminine words and the statement was reposted to a different site using the same social media platform. This time, the gender-neutral option was left out of the possible answers and respondents were asked to rate the statement as either feminine or masculine. Though several respondents indicated that they thought the statement was masculine, over half of the 20 respondents who participated indicated that the statement was feminine, so this manipulation was determined to be successful.

Qualitative data also indicated that this was a successful manipulation as some of the responses were as follows: “Feminine based on a few word choices in the text,” “Well, it reads as less stereotypically masculine, so I’ll go with feminine,” and “Regardless of subject matter the

language is feminine.”

Finally, the masculine manipulation was posted to another site on the social media platform and participants were asked to rate the statement as either feminine or masculine. Almost all 20 participants rated the statement as masculine, so the manipulation was determined to be successful. However, the qualitative commentary suggested that the statement should have had a gender-neutral option and that stereotypes were bad.

The experiment was conducted completely online using the KSU SONA System. Participants were not informed of the gendered wording manipulation in the recruitment material, only that they were being asked to rate an advertisement. First, participants completed the informed consent form, and then one of the three variations of the online STEM recruiting material was presented to the participants (57 participants read the masculine condition, 63 participants read the feminine condition, and 61 participants read the gender-neutral condition). After reading the material, the participants responded to the evaluation forms measuring perceived program attractiveness and perceived sense of institutional belongingness, then the demographic questions, and last the BSRI. Participants were then debriefed on the true purpose of the experiment.

Analyses

A two-way multivariate analysis of covariance was conducted to examine the differences between men and women in ratings of program attractiveness and perceived institutional belongingness according to the manipulation of gendered wording for the STEM recruitment material. Additionally, this analysis controlled for participants’ measures of masculinity and femininity due to individual differences (as measured by the BSRI). This allowed for comparison of the mean ratings of male and female participants’ measured program

attractiveness and belongingness across the three conditions (masculine, feminine, and neutral wording) while taking into account the effect of the possible covariates of masculinity and femininity.

To begin the analysis, several items in the perceived attractiveness and perceived belongingness scales were reverse-coded for negatively phrased questions. Then an average score was computed for both of the measures. Next, the BSRI items were scored according to the scoring index. Participants' averages for masculine and feminine categories were calculated by taking their scores on the items in each category and dividing by 20 (the number of questions). Androgyny and undifferentiated scores from the BSRI were not calculated, as these were not determined to be possible covariates. The potential covariates that were identified were only if an individual was high or low in masculinity or femininity (because of the masculine and feminine wording of the recruitment materials), so these were the averages that were calculated to be used in the analyses.

Before running the MANCOVA some assumptions of the general linear model had to be met. Because there was no missing data and no concerning outliers, the next step that was taken was to determine if the potential covariates actually correlated with the dependent variables. They did: perceived program attractiveness was positively correlated with masculinity ($r = .182$, $p < .05$) and femininity ($r = .261$, $p < .001$). Perceived program belongingness also correlated with masculinity ($r = .159$, $p < .05$) and femininity ($r = .198$, $p < .01$). While the two dependent variables were correlated, ($r = .574$, $p < .001$), they did not correlate above .9, indicating that there was no multicollinearity present (Tabachnick & Fidell, 2013).

The MANCOVA was run with the three levels of gendered wording conditions and participants' sex as the independent variables, participants' measures of masculinity and

femininity as covariates, and perceived program attractiveness and sense of belongingness as dependent variables. The Box's M test was non-significant, indicating that there were no significant differences between the covariance matrices and that correlations between the dependent variables were equal across groups. The Levene's test of equality of error variances was also non-significant for both dependent variables, suggesting that there were no significant differences between the variances in the populations.

The MANCOVA revealed that the masculinity variable was not a significant covariate in the analysis (Wilks' $\lambda = .98$, $F(2, 170) = 2.11$, $p = .13$, $\eta^2 = .02$), but that femininity was a significant covariate (Wilks' $\lambda = .96$, $F(2, 170) = 3.65$, $p = .03$, $\eta^2 = .04$). The power to observe the effect of femininity was at .67. Furthermore, it was determined that the independent variable of the gendered wording condition was not significant at the multivariate level (Wilks' $\lambda = .99$, $F(4, 340) = .21$, $p = .94$, $\eta^2 = .002$) but that participants' sex was (Wilks' $\lambda = .95$, $F(2, 170) = 4.17$, $p = .02$, $\eta^2 = .05$). The power to observe the latter effect was at .73. Finally, there was no significant interaction between participants' sex and the gendered wording condition (Wilks' $\lambda = .95$, $F(4, 340) = 2.1$, $p = .08$, $\eta^2 = .02$).

In the test of between-subject effects, the participants' sex was examined more closely. Because of issues related to family wise error when running multiple comparisons, the Bonferroni correction method was employed to conservatively control for the incorrect rejection of the null hypothesis. To account for the two dependent variables, the significance level was adjusted to .025. Participants' sex was statistically significant for perceived program attractiveness, $F(1, 171) = 6.18$, $p = .02$, $\eta^2 = .04$ (with the observed power reported at .70) but was not statistically significant for perceived program belongingness, $F(1, 171) = .02$, $p = .89$, $\eta^2 < .001$. In addition, the covariate of femininity was looked at more closely. This covariate was

statistically significant for perceived program attractiveness $F(1, 171) = 7.3, p = .01, \eta^2 = .04$. The power to observe this effect was .77.

For the univariate tests, the p-value cut-off for statistical significance remained set at .025. Participant sex was a significant factor in ratings of program attractiveness, $F(1, 171) = 6.18, p = .01, \eta^2 = .04$, with power observed at .70. Significant pairwise differences in participants' sex were found for the dependent variable of perceived program attractiveness. Men scored lower ($M = 4.38; SD = 1.07$) in perceived program attractiveness than women ($M = 4.64; SD = 1.07$), resulting in a mean difference of .26 (Cohen's $d = .24$; Appendix I). The mean effect was statistically significant when adjusted for multiple comparisons with the Bonferroni correction ($p = .01$). These values were obtained after the covariate of femininity appeared in the model and was evaluated at the value of 3.52.

Discussion

It was anticipated that, for male participants, there would be no statistically significant differences across the gendered wording conditions (traditionally masculine wording, traditionally feminine wording, and gender-neutral wording) as far as STEM program attractiveness, and the male participants' perceived institutional belongingness (Hypotheses 3 and 4). These hypotheses were supported, as the MANCOVA revealed no statistically significant differences between the male participants' ratings of program attractiveness and belongingness due to the gendered wording condition.

For female participants, the mean scores of measured program attractiveness and belongingness were expected to differ significantly between all three conditions, and the greatest difference would be between the femininely- and masculinely-worded conditions. Specifically, it was expected that women would find STEM program material advertised using traditionally

feminine words to be most attractive and that STEM program material advertised using traditionally masculine words would be the least attractive; it was expected that the neutrally-worded condition would result in greater attraction to STEM programs than the masculinely-worded condition but not as great attraction as the femininely-worded condition (Hypothesis 1). Additionally, it was expected that women would express more perceived belongingness for the STEM program if it was advertised using traditionally feminine words than if it is advertised using gender-neutral or, to a greater extent, masculine words (Hypothesis 2). However, this was not the case. The gendered wording condition had no statistically significant impact on the ratings of program attractiveness or perceived sense of belonging for women.

While not statistically significant, there were some interesting differences between men and women in their ratings of program attractiveness and perceived belongingness across the three wording conditions that are worth mentioning. For instance, interestingly enough it was the gender-neutral wording condition that women rated as the most attractive to them ($M = 4.81$, $SD = .60$) whereas the femininely-worded ($M = 4.53$, $SD = .58$) and masculinely-worded ($M = 4.50$, $SD = .67$) conditions were rated lower in attractiveness (Appendix J). Additionally, the difference in program attractiveness was greatest between men and women for the gender-neutral worded condition. The same trend was found for the gender-neutral wording condition and women's perceived sense of belongingness: the gender-neutral condition ($M = 4.20$, $SD = .79$) had a higher rating of perceived belongingness than did the masculinely-worded ($M = 3.87$, $SD = .68$) and femininely-worded ($M = 3.89$, $SD = .92$) conditions (Appendix J). This was not hypothesized but if it can be replicated (and be shown to have statistical significance), it has some interesting implications, which will be discussed.

Because women expressed the most attraction and sense of belonging to a STEM

program that was advertised using gender-neutral words, one conclusion that could be drawn from this is that women do not prefer any kind of special wording when it comes to recruitment materials. A femininely-worded advertisement does not increase the attraction of women to that program nor how they view their place in it. One possible explanation for this effect is that gendered-wording is no longer highly relevant to the current population of new college students as the two sexes have intermingled in roles and jobs in the last six decades. Words relating to traditional gender roles may no longer be salient or even known to the younger population. This might explain why the masculinely-worded and femininely-worded program advertisements were not rated as highly, but it doesn't entirely explain why the gender-neutral wording for the program advertisement was rated the highest in perceived attractiveness.

An alternative explanation for the finding that women found the gender-neutral worded program advertisement most attractive may be because women do not want any perceived special treatment in training programs leading to an eventual position in the workplace. It is possible that the gender-neutral worded advertisement signaled the perception of an even playing field for both men and women in the STEM program by not showing a covert preference for one particular gender (as could be the case with the use of gender-specific wording). This may have been accomplished by not using the specific words that have been historically associated to the different sexes. The perception that they will be treated equitably and that the program signals no preferential treatment to either sex is something that may be attractive to women interested in joining STEM. This makes sense, as many women do not want special accommodations at work due to their sex. In the big scheme of things, it is entirely likely that women want to go to their jobs and be treated fairly as a worker, not as a female worker.

Further research (including qualitative research) needs to be conducted to determine if

there is support for the hypothesis that gender-neutral wording in job advertisements is most attractive to women. While the results of the present study had no statistical significance for the gendered-wording condition, it is possible that this finding (that women prefer gender-neutral wording over feminine and masculine wording) could be replicated with statistical significance and the appropriate theories supporting the implications of the research. It is also possible that the manipulation used in the present study was not strong enough and needs to be adjusted. Though the manipulations were pilot-tested and found to be effective, a new study could be designed to try to create a stronger manipulation and more substantial outcomes.

At the same time, one effect that was found with statistical significance from this study was that participants' sex did have an impact on their responses. Overall, women ($M = 4.64$, $SD = 1.07$) had a higher degree of attraction to the STEM program recruitment material than did men ($M = 4.38$, $SD = 1.07$), after participants' measures of femininity were accounted for as the covariate. This finding is unexpected, considering the current underrepresentation of women in the STEM fields.

However, this meaningful difference in participants' sex was not found to be related to their perceptions of institutional belongingness. This could be because the measure of institutional belongingness was not a vetted measure (such as the program attractiveness measure) that had gone through pilot testing and factor analysis. The institutional belongingness measure, though modeled after other efficacy measures, may not have been successful in the current study due to unknown psychometric properties of the measure. While the independent internal consistency of the nine generated statements was adequate (with the Cronbach's alpha equaling .83), further review of the scale should be conducted to refine the instrument.

Though institutional belongingness perceptions were not statistically affected by

participants' sex, it seems that their ratings of program attractiveness were. A possible explanation for the finding that women rated the STEM recruitment material as more attractive could be attributed to the sample that was utilized for the current study. This might be the case if the participant pool was irregular and that the women's higher ratings of program attractiveness were due to the majority of the participants already being science, technology, engineering, and mathematics majors. To double-check this, the participants' listed major or intended major was reviewed. Of the participants listed, 19 stated that they were undeclared, 15 were hard science majors, four were technology-related majors, 10 were engineering majors, and one was listed as a mathematics major. The remaining 130 participants' listed majors consisted of non-STEM field areas. Because the participants were not majoring in STEM fields at a disproportionate rate, the sample can be assumed to be reasonably indicative of the average college population. Therefore it's considered that the women in the current study did not find the STEM recruitment material more attractive due to them already being STEM majors. Therefore, a different explanation for the findings of this study must be examined.

Since the American Woman's Rights Movement in the early 19th century, the establishment of the Working Woman's Association in 1868 and the reform of the 19th amendment to the United States constitution for women's suffrage, women in America have gained a substantial power which has allowed them to be able to choose to attend college and join the workforce in the profession of their preference (Firestone, 2003). Currently, women are more likely than men to identify value in attending college and attribute higher education to increasing their knowledge and intellect; in fact, in a 2011 Pew Research Center survey, 81% of women reported this was their experience while only 67% of men did (Taylor, Parker, Fry, Wang, & Patton, 2011). As more women attend college and become recognized in fields

traditionally dominated by men, their professional interest in those fields may increase, leading to higher attraction to them. This is one explanation for the current findings of this study.

Nevertheless, women are still met with incredible obstacles when entering STEM programs which contributes to the lack of gender diversity seen in the fields. Women are likely to lack support for their endeavors to join STEM fields, are more likely to withdraw from STEM programs, and are less likely to advance in their STEM careers because of barriers found in the workplace due to their gender (Burke & Mattis, 2007). The still existing glass ceiling is perhaps most prominent in the fields of science, technology, engineering, and mathematics. This effect would likely be diminished as more STEM professional women advance in their fields and become prominent role models, demonstrating that women can be successful in any career they choose.

As more women enroll in college and appreciate the value of higher education, a larger pool of women who are currently interested in STEM fields will develop. Therefore, it is important for institutes of higher education to foster and develop women's interests in these areas. Special initiatives and recruiting efforts to encourage women's participation in STEM are present at many campuses across the U.S., as are professional societies dedicated to advancing women in their fields. Organizations in the workforce also have the opportunity to provide support for women by changing biased corporate climates and affecting system changes in company policies that allow for greater success of their female employees (Burke & Mattis, 2007). These efforts must be continued and improved upon. If not, considerable talent and ability could be lost and the STEM fields could suffer due to the lack of diversity and expertise that trained STEM professional women can bring to them.

Chapter 7 - Experiment Two

Individuals receiving information from organizations that indicates they may not be successful will likely not be attracted to the organization and therefore not wish to pursue that option (Rynes et al., 1991). Different individuals may perceive different aspects of their recruitment and selection experience as a signal that they will be unsuccessful: the demeanor of the recruiter, the atmosphere of the workspace during a job preview, or the perceived attitudes of the current employees. It was thought that STEM disciplines might appear as an unattractive option to women because of signals by the organization that they will not be successful, the most notable of these being the lack of female representation within STEM organizations. Because women do not have a prevalent presence within STEM institutions, they may be perceived as the subordinate or negatively-referenced group. Women who are applying for STEM programs or positions may perceive their lack of representation in the institution and feel intimidated or disinterested in pursuing the academic or career opportunity.

This effect, that women will be uninterested in pursuing STEM opportunities because of the lack of female representation in these domains, may be influenced by goal orientations. Whereas learning goal orientations and—to an extent—performance-approach goal orientations, are associated with positive behaviors and outcomes, performance-avoidance goal orientations are often not (Payne et al., 2007; Elliot & Dweck, 1988). Individuals with strong performance-avoidance goal orientations experience more negative outcomes and express greater fear and anxiety when performing a task or trying to accomplish a goal (Payne et al., 2007; Pintrich, 2000).

In the context of recruiting women to STEM programs, goal orientations could play a large role. For instance, women with learning goal orientations are likely to be less influenced

by the context of their workplace or the gender representation within the organization because they are intrinsically motivated and unconcerned with evaluation by their peers. Women having performance-approach goal orientations may be competitively motivated to succeed in a field or organization where women are less prevalent so that others can positively evaluate them on their efforts. However, a woman with a performance-avoidance goal orientation may be less attracted to STEM disciplines due to the belief that she will be negatively evaluated by her mostly male co-workers and/or supervisors. Therefore, it might be expected that women with performance-avoidance goal orientations will have the lowest result-oriented efficacy regarding STEM recruitment material due to the fear of failure in an organization where success appears less likely for their gender.

However, there is no reason that the impact of goal orientations on result-oriented efficacy wouldn't span across the genders. A man with a performance-avoidance goal orientation should be just as likely to be concerned with avoiding, making a mistake or error in front of others. Because of the fear of embarrassing oneself or losing respect, men with performance-avoidance goal orientations may also have lower result-oriented efficacy. Individuals with learning goal orientations and performance-approach goal orientations may be more optimistic (having higher result-oriented efficacy) at their chances for success and more likely to adopt adaptive goal-setting behaviors to achieve success in STEM organizations and institutions. This would be especially true for those individuals with learning goal orientations because they would not be considering peer evaluation (positive or negative) and would be intrinsically motivated to succeed in STEM disciplines. Therefore, it was hypothesized that:

H1: After reading STEM program material, participants with dominant performance-approach goal orientations will express lower result-oriented

efficacy than participants with dominant learning goal orientations but higher result-oriented efficacy than participants with dominant performance-avoidance goal orientations.

Method

Participants

The second experiment recruited 38 male students and 132 female students from Kansas State University as participants. These participants were recruited over the course of one semester from the on-line SONA research introductory psychology participant pool; participants could not sign up for the study if they had participated in the first experiment. The participants were mostly female (76.7%), Caucasian (80.8%), freshmen (74%) students with a mean age of approximately 19 years of age. All participants were treated in accordance with APA ethical guidelines in addition to Kansas State University's IRB guidelines.

Materials

The gender-neutral STEM recruiting material was utilized for this study (Appendix A: Neutral). The gender-neutral STEM program recruitment material was employed, as the current study aimed at investigating the effect of the goal orientation on result-oriented efficacy and not the use of gendered wording. The modified STEM material was the same as that used in Experiment 1 and was based on the Kansas State University GROW Program, obtained from the Kansas State University (KSU) website (http://www.k-state.edu/grow/just_for_girls.htm). Demographic data regarding the participants' age, sex, ethnicity, major, etc., were also collected (Appendix D).

Goal orientations were assessed using VandeWalle's (1997) validated, 13-item measure of the three-dimensional model (Appendix F). A 6-point Likert scale allowed respondents to rate

five items measuring learning goal orientations, four items measuring performance-approach goal orientations, and four items measuring performance-avoidance goal orientation.

Participants' dominant goal orientations were then determined based on their highest ratings of the three goal orientation components of the scale. The Cronbach's alpha coefficient for this scale was .69, which was lower than desired but at an acceptable level.

Result-oriented efficacy was measured using 13 generated questions that assess the participants' perceptions of task difficulty, self-efficacy regarding the task, feasibility of the task, and expected outcomes of the task (Appendix G). This survey is similar to the one used by van Hooft and Noordzij (2009), which closely follows Bandura's (1997) self-efficacy theory. Participants used a 6-point Likert scale (1 = Strongly Disagree; 6 = Strongly Agree) in order to indicate their agreement or disagreement with each statement. The internal consistency for this measure was acceptable, with a Cronbach alpha of .87.

Procedure

The experiment was conducted online using the KSU SONA System. Participants were given informed consent, the goal orientation measure, and then the gender-neutral variation of the online STEM recruiting material was presented. After reading the material, the participant responded to the demographic scale and the result-oriented efficacy scale. Participants were then debriefed.

Analyses

After the data was collected, it was examined for a variety of factors. After verifying that there were no outliers or missing data, the dominant goal orientation of the participant was determined from the VandeWalle (1997) measure of goal orientations by looking at the three factors of the VandeWalle (1997) scale. Five questions in the scale measured learning goal

orientation (questions one through five), four questions measured performance-approach goal orientations (questions six through nine), and four questions measured the participant's tendencies toward performance-avoidant goal orientations (questions 10 through 13). The average for each of these three goal orientations was calculated and compared across the three categories. The goal orientation with the highest average was determined to be the participant's dominant (or dispositional) goal orientation. Ten cases arose where the average score of the goal orientation was equal between learning goal orientations and performance-approach goal orientations. For the sake of simplicity, this data was excluded from the analysis. Each participant's dominant goal orientation was determined and coded. Unfortunately, the differences between the three groups were quite high: 102 participants had a dominant learning goal orientation, 45 participants had a dominant performance-approach goal orientation, and only 12 participants had a dominant performance-avoidance goal orientation. As could be expected, Levene's test for homogeneity of variances was significant ($p = .02$), so equal variances could not be assumed between the groups.

Next, the data was examined for normality using the Shapiro-Wilks test of normality. The Shapiro-Wilks test assumes that the experimental data distribution does not significantly differ from that of a typical normal distribution. This hypothesis was not rejected, since the distribution of result-oriented efficacy scores was not significantly different across all three groups: Learning goal orientations ($p = .30$), performance-approach goal orientations ($p = .38$), and performance-avoidance goal orientations ($p = .14$), indicating that the data was normally distributed. The data did have some skew and kurtosis, but it was determined not to be problematic for data analysis. Skew for each of the three goal orientations was neither above 1.0 nor below -1.0 and though all three conditions had a slightly platykurtic distribution, this was

within expected and acceptable ranges. In addition, the z-values were computed for the three goal orientation groups by dividing the skewness statistic by the standard error of skewness. Because the z-values for each orientation (learning goal orientation = -1.71, performance-approach goal orientation = .82, and performance-avoidance goal orientation = 1.36) were not greater than the integer 1.96 (in reference to the average z-distribution), the null hypothesis can be accepted, and it can be assumed that the skew of the sample was not statistically significant (Cramer & Howitt, 2004).

Though there were no hypothesized differences between men and women in terms of their mean goal orientations (due to the inconsistent findings in prior research), this was checked using a one-way ANOVA prior to hypothesis testing. There were no statistically significant difference between men and women in terms of learning goal orientations ($F(1, 158) = 2.36, p = .13$), performance-approach goal orientations ($F(1, 158) = .02, p = .89$), and performance-avoidance goal orientations ($F(1, 158) = .05, p = .83$). While there were more women in the sample than men, Levene's test for homogeneity of variance was not statistically significant for each goal orientation type ($p = .14, p = .19$, and $p = .28$, respectively), so the assumption of equal variances was met.

To test the hypothesis, the data was entered into a one-way ANOVA, with the factors being the three dominant goal orientations and the dependent variable being participants' measured result-oriented efficacy scores. This test indicated that there was a significant difference between the three groups, $F(2, 157) = 6.09, p < .01$. Indeed, a downward sloping diagonal draws a direct line between learning goal orientations ($M = 4.45, SD = .59$), performance-approach goal orientations ($M = 4.17, SD = .58$), and performance-avoidance goal orientations ($M = 3.89, SD = .98$), in terms of their ratings of result-oriented efficacy (Appendix

K). However, because the assumption of homogeneity of variance had not been met, post-hoc and additional analyses were examined. First, the robust test of equality of means was considered. Both the Welch and the Brown-Forsythe tests were found to be statistically significant ($p = .02$ and $p = .04$, respectively). This indicates that the null hypothesis (the three groups have equal means) should be rejected and that at least one of the group means varied significantly from the other(s).

Because of the non-homogeneous sample, the Games-Howell post-hoc test was used for multiple comparisons. It was found that individuals with dominant learning goal orientations had a significantly higher result-oriented efficacy average than participants with dominant performance-approach learning goal orientations (a mean difference of .28, $p = .03$, Cohen's $d = .48$). However, the difference that performance-avoidance goal orientations had between both learning goal orientations ($p = .18$) and performance-approach goal orientations ($p = .62$) was not found to be statistically significant, despite performance-avoidance goal orientations being the group with the lowest average result-oriented efficacy scores.

Discussion

The current experiment demanded a comparison of participants' strongest-measured (dominant or dispositional) goal orientations and their means of result-oriented efficacy scores, as reported by the questionnaire. It was expected that the mean scores of measured result-oriented efficacy would be greater for participants with dominant learning goal orientations than for participants with dominant performance orientations. Furthermore, it was expected that individuals with dominant performance-approach goal orientations would have higher ratings of result-oriented efficacy than individuals with dominant performance-avoidance goal orientations.

This hypothesis was only partially supported. While the individuals with dominant

learning goal orientations had the highest average result-oriented efficacy scores, it was only found to be a statistically significant mean difference when compared to the participants with dominant performance-approach goal orientations. Despite a mean difference of .55, when compared to learning goal orientations, and .28, when compared to performance-approach goal orientations, no statistically significant difference in result-oriented efficacy scores was found in participants' with dominant performance-avoidance goal orientations. This lack of effect is most likely due to the small sample size of the participants in the dominant performance-avoidance goal orientation category. Out of a sample of 160 participants, only 12 of these participants had a dispositional performance-avoidance goal orientation. This lack of data did not allow for an appropriate test of mean differences. Additionally, a 95% confidence interval demonstrated that the range of scores was quite high, with the difference in scores between participants with dispositional learning goal orientations and dispositional performance-avoidance goal orientations varying between -1.32 to .22, and scores varying from -1.06 to .49 for participants with dispositional performance-approach goal orientations (compared to performance-avoidance goal orientations). If an appropriate sample of participants with dominant performance-avoidance goal orientations could be recruited, it seems likely that the mean difference in result-oriented efficacy scores would be significant when compared to an equivalent group of participants with dominant learning goal orientations and dominant performance-avoidance goal orientations.

However, the current research did reveal a significant difference in result-oriented efficacy scores between participants with a dominant learning goal orientation and participants with a dominant performance-approach goal orientation, thus supporting the idea that participants with learning goal orientations have higher result-oriented efficacy than participants

with performance-approach goal orientations. Additionally, this effect may be magnified had the cells been more equivalent across the two groups. This information can have important implications, as an individuals' result-oriented efficacy (expectancies) plays an important role in guiding decision-making, completing tasks, and affecting mood and attitude (Bandura, 1997, Eccles & Wigfield, 2002). Because individuals with dominant learning goal orientations have higher and more positive result-oriented efficacy, they are at an advantage in that they believe they can accomplish tasks and that those accomplishments can affect change, more so than individuals with dominant performance-approach goal orientations.

Therefore, having a dominant learning goal orientation can result in people being more confident in trying new programs and undertaking potentially challenging goals and that this information can be used when advertising and recruiting for organizations, especially for STEM organizations. When talent acquisition specialists or head-hunters are recruiting for demanding job positions, knowing that applicants are not only interesting in learning and bettering themselves, but also that they believe in themselves and believe that they can affect outcomes, it can be an important factor in knowing if the applicant is the right fit for the job. Measuring job applicants' goal orientations is one possible substantive selection method that should be researched more in the future. This would need to be examined carefully, as a selection measure that results in adverse impact cannot be utilized by companies. Further research should be completed looking at the biographical characteristics of individuals with learning goal orientations and whether this is a viable selection method.

Furthermore, it may be desirable for organizations to train their employees to situationally adopt learning goal orientations. Should such an intervention be successful, this would be a great benefit to the organization in that their employees feel more adept and confident

in their abilities and work outcomes. As research has shown, individuals with learning goal orientations show greater self-efficacy, interest in the task, exhibit a more positive temperament, have greater intrinsic motivation, and are more likely to persist in completing their goals and put more effort into doing so (Payne et al., 2007; Pintrich, 2000; Elliott & Dweck, 1988). These traits and behaviors can all contribute positively to the work environment and job performance of the employee. Therefore, it behooves organizations to encourage employee adoption of situational learning goal orientations.

Training employees to adopt situational learning goal orientations could also improve the personal lives of their employees. By adopting situational learning goal orientations, employees may be better able to improve their lives outside of the workplace and hopefully improve the employee's work-life balance. A large amount of research has been conducted looking at work-family enrichment, which includes concepts such as positive spillover from work into the family life (and alternatively, the family life into work), facilitation (in which work can ease family life and vice-versa), and general enhancement of one domain due to the other. Through meta-analytic examination, it was determined that greatest job and family satisfaction occurred when work enriched family life and not the other way around (Shockley & Singla, 2011). If an employer were able to help employees adopt situational learning goals that were then used to improve their personal lives, this would be an occurrence of work-family enrichment that could result in greater job and family satisfaction.

Additionally, work-family enrichment was found to have a stronger positive impact on women (Shockley & Singla, 2011) due to a variety of reasons. Women and men value aspects of their jobs differently, which can affect their perceptions of the interaction of work and family. Also, the different roles in the job are more or less salient to the different sexes, which could

impact their perceptions of how work and family are affected by one another. Finally, the care-taking role that many women with families may face can cause anxiety when women perceive that their work roles are interfering; therefore, when work enriches that care-taking role, the anxiety is alleviated, resulting in greater satisfaction in both domains.

Knowledge of the effect that work-family enrichment has for women is highly important for jobs in which women are not as present, for instance, in the fields of STEM. Women with careers in STEM may be more successful when their organizations engage in work-family enrichment. As has been discussed, one possible way to do this could be by providing training to employees on how to adopt situational learning goals. While it may be likely that these women already have dispositional learning goal orientations, a training in how to frame learning goals that are situation-specific and emphasis on the adaptive features of learning goal orientations could be beneficial to women trying to be successful in jobs where women are less present. In addition, women's personal lives may be improved, resulting in greater work and life satisfaction.

Chapter 8 - Experiment Three

The final objective of this research was to determine if participants' situational goal orientations could be influenced to have the participants adopt situational learning goal orientations and to determine if having this learning goal orientation increased result-oriented efficacy regarding STEM program recruitment materials. Individuals with learning goal orientations are more likely to accept difficult challenges and try to further develop their abilities (Elliot & Harackiewicz, 1996; VandeWalle, 1997). The outcomes associated with having a learning goal orientation are many and very positive: greater self-efficacy, more task interest, positive affect, high intrinsic motivation, and greater effort and persistence in completing tasks (Payne et al., 2007; Pintrich, 2000; Elliott & Dweck, 1988). Additionally, there are benefits to the organizations of individuals who have learning goal orientations. These can include greater productivity, work motivation, job engagement, and possibly work-family enrichment.

Alternatively, individuals without a learning goal orientation may be less likely to exit their comfort zones and try novel tasks that could threaten their self-efficacy and undermine their abilities. Therefore, the goal of the third experiment was to attempt to increase participants' situational learning goal orientations and to see if this could positively influence their result-oriented efficacy. It was hypothesized that:

H1: Following a situational learning goal orientation intervention, participants will score higher on learning goal orientations than participants who did not receive the learning goal orientation intervention.

H2: Following a situational learning goal orientation intervention, participants will report higher result-oriented efficacy than participants who did not receive the learning goal orientation intervention.

Method

Participants

A total of 55 female students and 27 male students from Kansas State University were recruited for the current study over the course of two continuous semesters. Participants were not permitted to sign up for the research if they had participated in Experiment 1 or Experiment 2. The participant pool consisted of mostly female (67.1%), Caucasian (76.8%), freshmen (61%) students with a mean age of 20 years of age. All participants were treated in accordance with APA ethical guidelines in addition to Kansas State University's IRB guidelines.

Materials

A goal orientation training intervention program was designed and developed (Appendix H). This intervention closely followed the intervention program described by van Hooft and Noordzij (2009), though an abbreviated version. Rather than the full two week training van Hooft and Noordzij (2009) conducted, the program designed for this study was a 90 minute in-depth workshop teaching students how to frame (in general, and how to frame goals specifically). The training introduced students to the goal orientation framework, explained goal orientation theory, and provided examples of different goal orientations, with an emphasis being placed on the usefulness of (situational) learning goal orientations. The intervention had time set aside for participants to individually practice setting learning goals and an opportunity for the instructor to provide feedback and help participants with their goal-setting. Three practice tasks were completed by the participants with their peers, with the instructor supervising and providing feedback to the groups. The training seminar had both an overview period (in which participants and the instructor introduced themselves and went over the aims of the training) and conclusion period (in which the instructor reviewed the highlights of the training, reiterated the benefits of

learning goal orientations, and discussed applications of setting learning goals in the “real world”).

A control condition workshop was also developed in order to maintain the integrity of the overall experiment and to expose the participants in the control group to somewhat comparable conditions. This workshop was also no more than 90 minutes and involved an introduction to the application of I/O psychology to industry within Human Resources. The seminar very generally discussed personnel selection and hiring practices; none of the subject matter pertained to the purpose of the current research. Participants in this condition also received hands-on practice (both from the instructor and from peers); however, it was practice performing a behaviorally-based interview.

The current study required the neutrally-worded STEM recruiting material (Appendix A: Neutral). The gender-neutral wording of the STEM program recruitment material was used, as this study was aimed at investigating the effect of the goal orientation intervention and not the use of gendered wording. Additionally, demographic questions (regarding sex, ethnicity, class ranking, etc.) were also asked and compiled (Appendix D).

As in the second experiment, participants’ goal orientations were measured using VandeWalle’s (1997) goal orientation measure (Appendix F). A measure of strictly situational goal orientation was not found during an in-depth review of the literature on PsychINFO, so the general goal orientation measure by VandeWalle (1997) was used for consistency. This 13-item scale measures the three-dimensional model of goal orientation, however only the learning goal orientation dimension was utilized for hypothesis testing. The first five questions of the scale measure participants learning goal orientation; because of the situational nature of the seminars, the participants’ measures of learning goal orientation that were obtained following the seminars

were assessed as if they were situational. Using a 6-point Likert scale (1 = Strongly Disagree; 6 = Strongly Agree), respondents rated all 13 statements, but only the average of the first five questions were retained for data analysis (as Hypothesis 1 specified only an increase in learning goal orientations). The Cronbach alpha coefficient for the first five items in the scale was found to be at an acceptable value, .87.

Result-oriented efficacy scores were again measured using the 13 generated statements assessing participants' perceptions of task difficulty, their self-efficacy regarding the task, expected outcomes of the task, and the perceived feasibility of the task (Appendix G). A 6-point Likert scale (1 = Strongly Disagree; 6 = Strongly Agree) was utilized so participants could indicate their agreement or disagreement with the statements. The Cronbach alpha coefficient for this scale was .81, indicating adequate internal consistency.

Procedure

The experimenter recruited in-person on the KSU campus over the course of the 2015 summer semester and the 2015 fall semester. The recruiter gained permission from instructors to speak to students in-class and encourage their participation in the study. Incentives such as earning extra-credit and the chance to enter a drawing for a \$100 Amazon gift card were utilized to increase the likelihood of their participation. Participants were also recruited online through the KSU SONA system during the fall semester. The experiment was laboratory-based and required in-person participation. After signing up for the research, participants were randomly assigned to an experimental condition (39 participants) and a control condition (43 participants). The design of the study was post-test only, but with a control group with which to compare the goal orientations and result-oriented efficacy scores. The between-subjects design was necessary in order to combat demand characteristics that can arise from participants filling out survey items

multiple times and becoming aware of the purpose of the study and attempting to respond in a certain way because of that knowledge. Facing an analogous issue in their study, Rubin and Badea (2010) "eliminated this potential source of demand characteristics by using a between-subjects design" (pp. 411). Due to random assignment, it can be assumed that any significant mean score differences between the experimental group and the control group would not be due to chance but due to the intervention.

Participant contact information was collected during recruitment and participants were randomly assigned to the experimental group or the control group and were scheduled to attend one of the sessions. Upon arrival to the laboratory, participants completed the informed consent form and signed up for extra credit (if applicable) and the gift-card drawing. The control group was instructed on a brief seminar on the topic of industrial/organizational psychology and HR. Participants in the experimental group were instructed on the learning goal orientation framework and how to set and pursue learning goals. Participation in the in-class exercises was mandatory and the instructor ensured that all participants were involved in practicing setting learning goals, both by themselves and with peers. Participants shared the learning goals that they had set with the rest of the group and explained why they were learning goals. The participant, his or her peers, and the instructor expanded on what was shared.

The experimental group learning goal orientation intervention and the control group I/O psychology seminar were followed with participants filling out the demographic questionnaire and the goal orientation measure by VandeWalle (1997). Next, participants were presented with the neutrally-worded STEM recruitment material and then filled out the result-oriented efficacy measure regarding the STEM program. Finally, participants were thoroughly debriefed and told the purpose of the study.

Analyses

A between-subjects post-test design was utilized to test Hypothesis 1 and Hypothesis 2. This allowed comparison of the mean levels of learning goal orientation and result-oriented efficacy (as reported by the questionnaire) from the participants who received the learning goal orientation training intervention compared to the participants who did not receive the learning goal orientation training intervention.

The data was determined to have no missing data or outliers and was also examined for skew and kurtosis. Result-oriented efficacy scores were very slightly negatively skewed (-.31), however this was not considered to be a problem for data analysis. The z-value for result-oriented efficacy was calculated by dividing the skewness statistic by the standard error of skewness and it was found to be -.97, which not problematic for data analysis (Cramer & Howitt, 2004). However, learning goal orientations were highly negatively skewed (-1.75), with a z-value of -6.54, which indicates that the skew was statistically significant (Cramer & Howitt, 2004). Kurtosis was low for result-oriented efficacy (.02), indicating a not excessive platykurtic distribution, but kurtosis was incredibly high for learning goal orientations (5.98).

The Shapiro-Wilks test of normality was conducted on the data to determine if the distribution of the collected data was significantly different from that of a normal distribution. The null hypothesis of the Shapiro-Wilks test states that the experimental data distribution is normal and that the experimental data does not significantly differ from a typical normal distribution. This hypothesis was not rejected for the distribution of result-oriented efficacy scores, as the test statistic p-value was non-significant for both the experimental ($p = .42$) and control groups ($p = .78$). However, the distribution of the learning goal orientation averages for both the control ($p = .02$) and the experimental conditions ($p < .001$) had p-values of less than

.05, indicating that the distribution of the learning goal orientation data was not normal.

Because of the non-normal distribution of the data, it was determined that the data should be transformed. A reflection and square root transformation was selected for this procedure because of the negative skew and because the range of scores in the distribution was not too extreme (and requiring a different transformation). Because there were no negative numbers or values of less than one, a constant was not added during the transformation; however, to reflect the scores, the values were subtracted from seven (six being the maximum value in the data set for both measures). After the data transformation, a comparison of experimental and control group means was conducted on both learning goal orientations and result-oriented efficacy. The Levene's test of equality of error variances was non-significant for both learning goal orientation and result-oriented efficacy, suggesting that there was equal variance between the control and experimental groups.

To determine if the sampled men and women had similar mean learning goal orientations, a t-test was run comparing the sexes on their measure of the learning goal orientation dimension (this was not a hypothesis, but it was a point of interest due to the uncertainty surrounding the literature). Levene's test for homogeneity of variance was not significant ($p = .67$), so the groups were assumed to have equal variance. Men and women were found to have significantly different mean learning goal orientations, $t(76) = -2.48$, $p = .02$, with women ($M = 1.49$, $SD = .27$) scoring higher than men ($M = 1.33$, $SD = .22$).

To test the first hypothesis, an independent-samples t-test was conducted to compare the learning goal orientations between the experimental and control conditions. There was a non-significant difference in the scores for the experimental group ($M = 1.45$, $SD = .26$) and the control group ($M = 1.43$, $SD = .27$); $t(76) = .26$, $p = .79$ (see Appendix L). A test of hypothesis

two revealed that there was a non-significant difference in the result-oriented efficacy scores for the experimental group ($M = 2.19$, $SD = .03$) and the control group ($M = 2.19$, $SD = .03$); $t(76) = .21$, $p = .83$ (see Appendix L). For the t-tests, the mean differences between groups were less than .01 and -.01, respectively.

Discussion

It was anticipated that participants in the experimental condition who received the learning goal orientation training intervention would score significantly higher in measures of learning goal orientation and result-oriented efficacy. In addition, it was expected that participants in the control group who did not receive the learning goal orientation training intervention would score significantly lower on learning goal orientation and result-oriented efficacy measures.

This was not the case for the current experiment and neither hypothesis was supported. There are several possible reasons for this outcome. It is likely that because participants' scores for learning goal orientation were so skewed for both the control and experimental groups that no statistically significant variance in the scores was found with the given intervention (Hypothesis 1). Before data transformation, on a Likert scale ranging from one to six, participants' means for learning goal orientations were 4.84 ($SD = .78$) for the experimental group and 4.88 ($SD = .87$) for the control group, indicating that there was likely a ceiling effect. Because the item response averages from the participants were so high, this would indicate that a very acute intervention would be necessary to increase the experimental group's average, which was already fairly high (as was the control groups'). Unfortunately, the 90-minute seminar did not appear to have that effect, most likely due to the abbreviated nature of the intervention.

It is possible that an increase in averages may have occurred following a longer

intervention. The learning goal orientation intervention conducted by van Hooft and Noordzij (2009) on unemployed job seekers was a two week training. Additionally, participants in the long-term intervention were asked to take home exercises and practice their goal framing at home, which was not done in the current study. While the learning goal orientation may still be a viable way to increase participants learning goal orientations (as was the case in the previously mentioned intervention), it does not appear to be something that can be confined to a brief seminar. The current orientation was modeled after the successful two-week intervention, but due to expected high attrition rates, it was confined to the 90-minute, in-person class. This may have jeopardized the successfulness of the intervention and resulted in the non-significant results that were found. Additionally, the populations of the two studies were very different, and unemployed job seekers may have had additional impetus and demands that motivated them to set learning goals, more so than the college population.

One additional problem could have resulted from the measure of learning goal orientations. The measure used to assess learning goal orientations (created by VandeWalle, 1997) was a general measure of the three goal orientations (learning goal orientation, performance-approach goal orientation, and performance-avoidance goal orientation). Prior to the study, the goal orientation research was combed to determine if a situational learning goal measure existed. Unfortunately, no such measure was found in the PsychINFO database that was utilized for this search. It was determined that the VandeWalle (1997) measure of goal orientations would provide an adequate measure of participants' goal orientations following the intervention and would be preferable to generated statements that had not been tested for reliability prior to the study. Additionally, the experiment was situationally confined to the in-laboratory seminar and was a very specific experience that was situational in nature.

However, participants' result-oriented efficacy was also not increased by the intervention. The averages were again quite high and quite similar between both the experimental ($M = 4.73$, $SD = .64$) and the control ($M = 4.75$, $SD = .52$) groups, prior to data transformation. While the short nature of the intervention could be affecting the lack of change in the experimental group means, it is also likely that participants' item response averages were nearly maxed out, leaving little room for score improvement from the intervention (had it been successful).

Though these results are disappointing, knowledge from this experiment can be gained as it appears that shortened interventions, no matter how directly related to the topic, do not appear to be very useful in situationally influencing learning goal orientations and result-oriented efficacy. A longer orientation, across several weeks, may have made a difference in increasing the experimental groups' learning goal orientations (as this has been demonstrated before; see van Hooft & Noordij, 2009). Additionally, it may be necessary to have a STEM-related intervention to increase STEM-related efficacy, as affecting one's learning goal orientation may not necessarily result in his or her result-oriented efficacy for a STEM program being affected. This concept, that STEM-related efficacy comes from STEM-related interventions, is the cornerstone for after-school STEM programs, summer STEM camps, and on-campus STEM clubs and groups. These programs and others are important to boys, girls, men, and women who need an additional boost in their confidence to demonstrate to them that they are capable of succeeding in the STEM fields. Directly influencing students' perceptions about themselves and how they can succeed in STEM—these are the interventions that the United States needs to persist at to increase the STEM workforce and the number of women in that workforce.

One unexpected finding was that there was a gender difference between men and women in mean learning goal orientation scores. Though no sex difference was hypothesized, the

finding that women had greater learning goal orientations contributes to the current body of literature surrounding goal orientation research. It also may provide additional support for the utilization of goal orientation measures during substantive selection as well. If the goal orientation literature can begin to consistently show that women score higher in the learning goal orientation dimension, assessing applicants' measures of learning goal orientations during selection should not result in adverse impact against women; this may help recruitment efforts in increasing the number of women in the STEM fields.

Chapter 9 - General Discussion

Several conclusions can be drawn from the three experiments that were conducted. First, though the gendered-wording condition in the first experiment was not successful, there were some promising results that need further research. While the wording manipulation was possibly not strong enough, there could be promising avenues for future research in specialized recruitment wording, though perhaps not in the way initially conceived. Gender-neutral wording in recruitment materials may signal to potential applicants that the playing field is open and equal to both men and women; this could be an attractive message that increases female applicants' interest in a specific program. Equity theory, first proposed by Adams (1963), discusses the concept of fairness that is founded on the individual's perception that his or her efforts and gains (inputs and outputs) are equivalent as compared to one's peer (Pritchard, 1969). When women are investigating a career field and know that women are not as prevalent in this field, signals of equity could be very important in order to attract these women to the program. A gender-neutral recruitment message may signal equity and that a woman's inputs and outputs in the field would be valued equally to that of a man. Recruitment materials that send a message of gender equality through means of gender-neutral wording may be the most effective way to attract female applicants, especially those in fields where women are less common. This needs to be confirmed empirically and it would be useful to gain additional insight through qualitative data, in regards to what about specific recruitment material is most attractive to women, why, and their perceptions of what messages about the company may be conveyed through it.

The perceived institutional belongingness scale from the first experiment also should be refined. The current data set will be used to look at the factor loadings of the scale and examine the potential for dimension reduction. Afterwards, more scale items may be needed and would

have to be pilot tested on a new sample. Because a new sample would be utilized, the Likert scale for this measure could also be adjusted to determine the effect that this has on the scale's psychometric properties.

Additionally, it was interesting to find that women rated the STEM recruitment material as more attractive than men did. This may be the beginning of a trend that can be seen as women take a dominant role in higher education and are emboldened to enter male-dominated work fields and programs of study. After-school STEM programs, STEM societies for female workers, and inclusive workplace and educational programs are critically important to increase the number of talented women experts in the fields of science, technology, engineering, and mathematics. These programs and more are enacted across the United States currently; they need to be further endorsed so that the STEM fields can continue to grow, attract, and retain a talented workforce.

Another implication from this research can be drawn from the small sample of participants with dominant performance-avoidance goal orientations from Experiment 2; only 7.5% of the participants recruited for this study were identified as having a dominant or dispositional performance-avoidance goal orientation. This is quite interesting should the current finding be indicative of the general population; it can prove to be a challenge that researchers must overcome if only a small number of their participants appear to have dominant performance-avoidance goal orientations. However, considering the maladaptive nature of the performance-avoidance goal orientations, this is not necessarily a negative prospect for participants. When studying goal orientations, researchers' recruitment methods may need to be intensified for this particular group.

It is gratifying to see that participants with dominant learning goal orientations do have

greater result-oriented efficacy than participants with dominant performance-approach goal orientations. As is known from the current body of literature, learning goal orientations have many positive outcomes associated with this orientation style. This finding has implications in job performance, motivation, employee engagement, and work-life satisfaction, which are incredibly important outcomes for all organizations. Should this study be replicated and an adequate and homogenous sample be recruited, it may additionally be revealed that participants with dominant performance-avoidance goal orientation do, in fact, have (statistically) significantly lower result-oriented efficacy than either learning goal orientations and performance-approach goal orientations.

Another means of data analysis could also improve the second study. Because the latent goal orientation variables are categorical (learning, performance-approach, and performance-avoidance goal orientations) but the manifest variables are continuous and goal orientation scale is measured using a Likert scale (VandeWalle, 1997), Latent Profile Analysis (LPA) may be a more fitting analysis to utilize. LPA is able to reduce the continuous variables into subgroups, which allows for easier interpretation and may help with the unequal group sizes that were present in Experiment 2 (Oberski, n.d.). This may be preferred over the ANOVA and/or a regression analysis.

Finally, it was also determined that the abbreviated learning goal orientation workshop was not a successful intervention and that a longer, more in-depth mediation is most likely necessary in order to increase participants' situational learning goal orientations and result-oriented efficacy. This finding may also have implications for the current operations of many short-term HR programs. Sexual harassment trainings, work-place safety trainings, and incivility trainings at the workplace are key programs that HR departments may instruct and sometimes

these training sessions only receive a few hours of attention. While individual program evaluation would be needed to determine the success of an HR intervention in the workplace, it may be useful for organizations to use a longer, more in-depth employee program than to have a large array of shorter-term programs. In trying to cover all of the important topics that should be instructed to employees, the efficiency of having many short training sessions may be compromising the effectiveness of these interventions.

A limitation of Experiment 3 was that there was no known measure of situational learning goal orientations. Such a measure would improve future research in this area significantly. A situational measure of goal orientation that can generalize or be applied to situation-specific research needs to be created, validated, and refined in a pilot study to ensure the psychometric properties of the measure are sound. Additionally, the Solomon Four Group research design may be useful in fully determining the effects of the intervention. By utilizing this research design, measures can be provided prior to the intervention and then reassessed post-intervention and concerns regarding demand characteristics or influences on participant responding can be minimized and/or controlled for. This may provide a clearer understanding of the true influence of the intervention, be it long-term or abbreviated.

As has been previously discussed, further support for women in the fields of science, technology, engineering, and mathematics should be encouraged. Women in STEM face discrimination, hostility, and career immobility, among other difficulties. Because of this, many intelligent, skilled, and qualified women choose to focus their careers in other fields. Initiatives and programs promoting the presence of women in STEM are vitally important to ensure that these qualified workers have the support they need to feel welcome in these fields. Further success of the STEM fields demands this, and it would be a disservice to not only the women

who are excluded, but also the integrity of the STEM intellectual community to continue to see that capable and intelligent women are not being instructed and allowed to contribute their knowledge, skills, and abilities to improve the study of STEM.

References

- 2018 SOC Revision Process. (n.d.). Retrieved September 8, 2014, from <http://www.bls.gov/soc/>
- U.S. Department of Commerce, Economics and Statistics Administration and Executive Office of the President, Office of Management and Budget. (2011). *Women in America: Indicators of social and economic well-being*, Retrieved from website: <http://www.esa.doc.gov/sites/default/files/reports/documents/womeninamerica.pdf>
- Adams, J. S. (1963). Towards an understanding of inequality. *Journal of Abnormal and Normal Social Psychology*, (67), 422–436.
- Anderson, D. M., & Dixon, A. W. (2009). Winning isn't everything: Goal orientation and gender differences in university leisure-skills classes. *Recreational Sports Journal*, 33, 54–64.
- Austin, J. T., & Vancouver, J. B. (1996). Goal constructs in psychology: Structure, process, and content. *Psychological Bulletin*, 120(3), 338–375.
- Bandura A. (1997). *Self-Efficacy: The exercise of control*. New York: Freeman. Retrieved from Google Books: http://books.google.com/books?id=eJ-PN9g_o-EC&pg=PA212&source=gbs_toc_r&cad=4#v=onepage&q&f=false
- Barry, H., Bacon, M. K., & Child, I. L. (1957). A cross-cultural survey of some sex differences in socialization. *Journal of Abnormal and Social Psychology*, 55, 327–332.
- Beede, D., Julian, T., Langdon, D., McKittrick, G., Khan, B., & Doms, M. U.S. Department of Commerce Economics and Statistics Administration, Office of the Chief Economist. (2011). *Women in stem: A gender gap to innovation* (ESA Issue Brief #04-11). Retrieved from website: <http://www.esa.doc.gov/sites/default/files/reports/documents/womeninstemagaptoinnovation8311.pdf>
- Bem, S. L. (1974). The measurement of psychological androgyny. *Journal of Consulting and Clinical Psychology*, 42, 155–162.
- Benbow, C.P. (2012). Identifying and nurturing future innovators in science, technology, engineering, and mathematics: A review of findings from the study of mathematically precocious youth. *Peabody Journal of Education*, 87, 16–25.
- Burke, R. J., & Mattis, M. C. (2007). *Women and minorities in science, technology, engineering, and mathematics: Upping the numbers*. Edward Elgar. Retrieved January 10, 2016 from https://books.google.com/books?hl=en&lr=&id=zgsvXQ4GbfcC&oi=fnd&pg=PR4&dq=attracting+women+to+STEM&ots=25l7Valuu5&sig=9lYrfS6oSG525Dv-ytQ_2LjIOSc#v=onepage&q=attracting%20women%20to%20STEM&f=false
- Button, S. B., Mathieu, J. E., & Zajac, D. M. (1996). Goal orientation in organizational research:

- A conceptual and empirical foundation. *Organizational Behavior and Human Decision Processes*, 67(1), 26–48
- Carnevale, A. P., Smith, N., & Melton, M. (2011). “STEM: Science, Technology, Engineering, and Mathematics.” [Executive Summary]. *Georgetown University Center on Education and the Workforce*. Retrieved from Google Scholar.
- Cook, J. E., Purdie-Vaughns, V., Garcia, J., & Cohen, G. L. (2012). Chronic threat and contingent belonging: protective benefits of values affirmation on identity development. *Journal of Personality and Social Psychology*, 102(3), 479–496. doi:10.1037/a0026312
- Cotter, D. A., Hermsen, J. M., Ovadia, S., & Vanneman, R. (2001). The Glass Ceiling Effect. *Social Forces*, 80(2), 655–682.
- Cramer, D., & Howitt, D. (2004). *The Sage dictionary of statistics: A practical resource for students in the social sciences*. Thousand Oaks: Sage.
- Dambrun, M., Duarte, S., & Guimond, S. (2004). Why are men more likely to support group-based dominance than women? The mediating role of gender identification. *British Journal of Social Psychology*, 43, 287–297.
- Davies-Netzley, S. A. (1998). Women above the glass ceiling: Perceptions on corporate mobility and strategies for success. *Gender & Society*, 12(3), 339–355.
- Dweck, C. S., & Leggett, E. L. (1988). A social-cognitive approach to motivation and personality. *Psychological Review*, 95(2), 256–273.
- Eagly, A. H., & Karau, S. J. (2002). Role congruity theory of prejudice toward female leaders. *Psychological Review*, 109(3), 573–598.
- Eccles, J. S., & Wigfield, A. (2002). Motivational beliefs, values, and goals. *Annual Review of Psychology*, 53, 109–132.
- Elliott, E. S., & Dweck, C. S. (1988). Goals: An approach to motivation and achievement. *Journal of Personality and Social Psychology*, 54(1), 5–12.
- Elliot, A. J., & Harackiewicz, J. M. (1996). Approach and avoidance achievement goals and intrinsic motivation: A mediational analysis. *Journal of Personality and Social Psychology*, 70(3), 461–475.
- Faul, F., Erdfelder, E., Lang, A. G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, 39, 175–191.
- Firestone, S. (2003). *The Dialectic of Sex: The Case for Feminist Revolution*. MacMillan. Retrieved January 10, 2016 from

<https://books.google.com/books?hl=en&lr=&id=z4YMFaRJAVQC&oi=fnd&pg=PT27&dq=feminist+revolution&ots=SV61PHnvlD&sig=RYEdgjRidiNAv-lvARlsBy5u0JA#v=onepage&q=feminist%20revolution&f=false>

- Gaucher, D., Friesen, J., & Kay, A. C. (2011, March 7). Evidence that gendered wording in job advertisements exists and sustains gender inequality. *Journal of Personality and Social Psychology*, 101(1), 109–128. doi: 10.1037/a0022530
- Glass, C., & Minnotte, K.L. (2010). Recruiting and hiring women in STEM fields. *Journal of Diversity in Higher Education*. Advance online publication. doi: 10.1037/a0020581
- Guion, R. M. (2011). *Assessment, measurement, and prediction for personnel decisions*. Routledge: New York.
- Hernandez, P. R., Schultz, P. W., Estrada, M., Woodcock, A., & Chance, R. C. (2013). Sustaining optimal motivation: A longitudinal analysis of interventions to broaden participation of underrepresented students in STEM. *Journal of Educational Psychology*, 105, 89-107. doi:10.1037/a0029691
- Hoffman, C., & Hurst, N. (1990). Gender stereotypes: Perception or rationalization? *Journal of Personality and Social Psychology*, 58, 197– 208.
- Hollander, J. A., & Abelson, M. J. (2014). Language and Talk. In J. D. McLeod, E. J. Lawler, & M. Schwalbe (Eds.), *Handbook of the social psychology of inequality* (pp. 181–206). New York: Springer.
- Leaper, C., Farkas, T., & Brown, C.S. (2012). Adolescent girls' experiences and gender-related beliefs in relation to their motivation in math/science and English. *Journal of Youth and Adolescents*, 41, 268–282.
- Lievens, F., & Chapman, D. (2009). Recruitment and selection. In A. J. Wilkinson, T. Redman, S. Snell, & N. A. Bacon (Eds.), *The SAGE handbook of human resources management* (pp. 133–154). London, UK: Sage.
- Miller, D. I., & Halpern, D. F. (2012). Can spatial training improve long-term outcomes for gifted STEM undergraduates? *Learning and Individual Differences*. Advance online publication. doi:10.1016/j.lindif.2012.03.012
- Newman, D. A., & Lyon, J. S. (2009). Recruitment efforts to reduce adverse impact: Targeted recruiting for personality, cognitive ability, and diversity. *Journal of Applied Psychology*, 94(2), 298–317.
- Newman, M. L., Groom, C. J., Handelsman, L. D., & Pennebaker, J. W. (2008). Gender differences in language use: An analysis of 14,000 text samples. *Discourse Processes*, 45, 211–236.

- Nicholls, J. G. (1984). Achievement motivation: Conceptions of ability, subjective experience, task choice, and performance. *Psychological Review*, 91, 328–346.
- Oberski, D. L. (n.d.). Mixture models: latent profile and latent class analysis. In Robertson, J., & Kaptein, M. (Eds.), *Modern statistical methods for HCI: a modern look at data analysis for HCI research*.
- Payne, S. C., Youngcourt, S. S., & Beaubien, J. M. (2007). A meta-analytic examination of the goal orientation nomological net. *Journal of Applied Psychology*, 92(1), 128–150.
- Pintrich, P. R. (2000). Multiple goals, multiple pathways: The role of goal orientation in learning and achievement. *Journal of Educational Psychology*, 92(3), 544–555.
- Pratto, F., Sidanius, J., Stallworth, L. M., & Malle, B. F. (1994). Social dominance orientation: A personality variable predicting social and political attitudes. *Journal of Personality and Social Psychology*, 67, 741–763.
- Pritchard, R. D. (1969). Equity theory: A review and critique. *Organizational Behavior and Human Performance*, 4, pp. 176-211. Retrieved January 24, 2016 from [http://beta.orionsshoulders.com/Resources/articles/19_22187_PRITCHARD%20RD%20\(1969\).pdf](http://beta.orionsshoulders.com/Resources/articles/19_22187_PRITCHARD%20RD%20(1969).pdf)
- Rashidi, N., & Javanmardi, F. (2012). The relationship between Iranian EFL students' achievement goal orientation and their gender. *Education*, 2(1), 8–15.
- Roeser, R. W., Midgley, C., & Urdan, T. (1996). Perceptions of the school psychological environment and early adolescents' psychological and behavioral functioning in school: The mediating role of goals and belonging. *Journal of Educational Psychology*, 88, 408–422.
- Rubin, M., & Badaea, C. (2010). The central tendency of a social group can affect ratings of its intragroup variability in the absence of social identity concerns. *Journal of Experimental Social Psychology*, 46, 410–415.
- Rudman, L. A., & Kilianski, S. E. (2000). Implicit and explicit attitudes toward female authority. *Personality and Social Psychology Bulletin*, 26, 1315-1328.
doi: 10.1177/0146167200263001
- Rynes, S. L., Bretz, R. D., Jr., & Gerhart, B. (1991). The importance of recruitment in job choice: A different way of looking. *Personnel Psychology*, 44, 487–521.
- Rynes, S. L., & Cable, D. M. (2003). Recruitment research in the twenty-first century. In I. B. Weiner, N. W. Schmitt & S. Highhouse (Eds.), *Handbook of psychology: Industrial and organizational psychology* (Vol. 12, pp. 311–340). Hoboken, NJ: John Wiley & Sons.

- Schmidt, A. M., Beck, J. W., & Gillespie, J. Z. (2013). Motivation. In I. B. Weiner, W. C. Borman, D. R. Ilgen, & R. J. Klimoski (Eds.), *Handbook of psychology: Industrial and organizational psychology* (Vol. 12, pp. 55–76). Hoboken, NJ: John Wiley & Sons.
- Schnelle, J., Brandstätter, V., & Knöpfel, A. (2010). The adoption of approach versus avoidance goals: The role of goal-relevant resources. *Motivation and Emotion*, 34, 215–229. doi: 10.1007/s11031-010-9173-x
- Shockley, K. M., & Singla, N. (2011). Reconsidering work—Family interactions and satisfaction: A meta-analysis. *Journal of Management*, 37(861). doi: 10.1177/0149206310394864
- Sidanius, J., & Pratto, F. (1999). *Social dominance: An intergroup theory of social hierarchy and oppression*. New York, NY: Cambridge University Press.
- Sidanius, J., & Pratto, F. (2011). Social dominance theory. In P. A. M. Van Lange, A. W. Kruglanski & E. T. Higgins (Eds.), *Handbook of Theories of Social Psychology* (pp. 418–438). Retrieved from <http://books.google.com/books?id=VCgClQEACAAJ>
- Sidanius, J., Pratto, F., Martin, M., & Stallworth, L. M. (1991). Consensual racism and career track: Some implications of Social Dominance Theory. *Political Psychology*, 12(4), 691–721.
- Slaughter, J. E., Zickar, M. J., Highhouse, S., & Mohr, D. C. (2004). Personality trait inferences about organizations: Development of a measure and assessment of construct validity. *Journal of Applied Psychology*, 89(1), 85–103.
- Tabachnick, B. G., & Fidell, L. S. (2013). *Using Multivariate Statistics* (6th ed.) Boston: Pearson.
- Taylor, P., Parker, K., Fry, R., Wang, W., & Patton, E. (2011, August 17). “Women see value and benefits of college; men lag on both fronts, survey finds.” Pew Research Center, Washington, D.C. Retrieved January 9, 2015, from <http://www.pewsocialtrends.org/files/2011/08/Gender-and-higher-ed-FNL-RPT.pdf>
- Turban, D. B. (2001). Organizational attractiveness as an employer on college campuses: An examination of the applicant population. *Journal of Vocational Behavior*, 58, 293–312.
- Turban, D. B., Forret, M. L., & Hendrickson, C. L. (1998). Applicant attraction to firms: Influences of organization reputation, job and organizational attributes, and recruiter behaviors. *Journal of Vocational Behavior*, 52, 24–44.
- Turner, J. C., Brown, R. J., & Tajfel, H. (1979). Social comparison and group interest in ingroup favouritism. *European Journal of Social Psychology*, 9, 187–204.

- van Hooft, E. A. J., & Noordzij, G. (2009). The effects of goal orientation on job search and reemployment: A field experiment among unemployed job seekers. *Journal of Applied Psychology, 94*(6), 1581–1590.
- VandeWalle, D. (1997). Development and validation of a work domain goal orientation instrument. *Educational and Psychological Measurement, 57*(6), 995–1015.
- VandeWalle, D. (2003). A goal orientation model of feedback-seeking behavior. *Human Resource Management Review, 13*, 581–604.
- VandeWalle, D., Cron, W. L., & Slocum, J. W. (2001). The role of goal orientation following performance feedback. *The Journal of Applied Psychology, 86*(4), 629–640.
- Walton, G. M., & Cohen, G. L. (2007). A question of belonging: Race, social fit, and achievement. *Journal of Personality and Social Psychology, 92*, 82–96.
doi:10.1037/0022-3514.92.1.82

Appendix A - Variations of the STEM Program Recruitment

Material

Feminine: The acronym STEM encompasses the fields of science, technology, engineering and mathematics. The STEM Program **commits** to **nurturing** individuals in these fields of study and **supporting** them in their chosen career path. Participants will gain **dependable** experience by doing hands-on activities, **cooperate** on field projects, and design experiments. A diverse range of activities will be included to emphasize the career possibilities in the STEM fields. This program seeks to encourage and inspire qualified individuals to **commit** to a future in science, technology, engineering, and mathematics, while providing a **pleasant** venue for **connecting** with others having the same occupational interests.

Masculine: The acronym STEM encompasses the fields of science, technology, engineering and mathematics. The **challenge** of the STEM Program is to engage individuals in these fields of study and **assert** their chosen career path. Participants will gain **confidence** and experience by doing hands-on activities, be **active** in working on field projects, and design experiments. A diverse range of activities will be included to emphasize the career possibilities in the STEM fields. This program seeks to **lead** qualified individuals to **determine** a **self-reliant** future in science, technology, engineering, and mathematics, while providing a platform for **outspoken** interaction with others having the same occupational interests.

Neutral: The acronym STEM encompasses the fields of science, technology, engineering and mathematics. The purpose of the STEM Program is to engage individuals in these fields of study and guide them on their chosen career path. Participants will gain experience by doing hands-on

activities, working on field projects, and designing experiments. A diverse range of activities will be included to emphasize the career possibilities in the STEM fields. This program seeks to further qualified individuals to consider a future in science, technology, engineering, and mathematics, while providing an opportunity for interaction with others having the same occupational interests.

Appendix B - Perceived Program Attractiveness Survey

Regarding the material you have just read about the STEM program, please rate the following statements in terms of how much you agree or disagree using the following scale:

- 1 = Strongly Disagree
- 2 = Disagree
- 3 = Disagree Somewhat
- 4 = Agree Somewhat
- 5 = Agree
- 6 = Strongly Agree

- _____1. I feel that this is an appealing program to have available to students.
- _____2. This advertisement made me consider looking into STEM programs.
- _____3. I want to learn more about STEM programs after reading this advertisement.
- _____4. I feel that this is an important program to have available to students.
- _____5. I admire the goals this program is seeking to fulfill.
- _____6. I agree with the premise of this program.
- _____7. I support the continuation of these types of programs.
- _____8. I find I have little support for STEM programs after reading this advertisement. (r)
- _____9. The goals of the STEM programs are unclear to me after reading this advertisement. (r)

Appendix C - Perceived Institutional Belongingness Survey

Regarding the material you have just read about the STEM program, please rate the following statements in terms of how much you agree or disagree using the following scale:

- 1 = Strongly Disagree
- 2 = Disagree
- 3 = Disagree Somewhat
- 4 = Agree Somewhat
- 5 = Agree
- 6 = Strongly Agree

- _____1. I feel very welcome to participate in this program after reading the advertisement.
- _____2. I think I would be a very good fit for a program such as this one.
- _____3. I feel the other people in this program would be very welcoming to me.
- _____4. I believe I would be highly valued if I were to join this program.
- _____5. I do not think I would be very successful in this program. (r)
- _____6. I would feel very uncomfortable joining this program. (r)
- _____7. I would feel like an outsider in this program. (r)
- _____8. I feel the other people in this program would not want me there. (r)
- _____9. I think I would belong in a program like this one.

Appendix D - Demographic Information Form

Age: _____

Sex (please circle one): Male Female Prefer not to disclose

Ethnicity: _____

Major or intended major of study or “undeclared”: _____

Class ranking (please circle one):

Freshman Sophomore Junior Senior Other

What is your GPA? _____

What is the highest/most advanced math course you have taken? _____

What is the highest/most advanced science course you have taken? _____

What is the highest/most advanced English course you have taken? _____

Appendix E - Bem Sex Role Inventory (BSRI; Bem, 1974)

Please rate yourself on each of the following statements in terms of how much you agree or disagree using a scale from 1 (never or almost never true) to 7 (almost always true),

- 1 -	- 2 -	- 3 --- 4 --- 5 -	- 6 -	- 7 -
never	rarely	neutral	often	always
1. Self-reliant		23. Shy		45. Happy
2. Defends own beliefs		24. Affectionate		46. Unpredictable
3. Independent		25. Flatterable		47. Reliable
4. Athletic		26. Loyal		48. Jealous
5. Assertive		27. Feminine		49. Truthful
6. Strong personality		28. Sympathetic		50. Secretive
7. Forceful		29. Sensitive to the needs of others		51. Sincere
8. Analytical		30. Understanding		52. Conceited
9. Has leadership abilities		31. Compassionate		53. Likable
10. Willing to take risks		32. Eager to soothe hurt feelings		54. Solemn
11. Makes decisions easily		33. Soft-spoken		55. Friendly
12. Self-sufficient		34. Warm		56. Inefficient
13. Dominant		35. Tender		57. Adaptable
14. Masculine		36. Gullible		58. Unsystematic
15. Willing to take a stand		37. Childlike		59. Tactful
16. Aggressive		38. Does not use harsh language		60. Conventional
17. Acts as a leader		39. Loves children		
18. Individualistic		40. Gentle		
19. Competitive		41. Helpful		
20. Ambitious		42. Moody		
21. Yielding		43. Conscientious		
22. Cheerful		44. Theatrical		

Appendix F - Goal Orientation Scale (VandeWalle, 1997)

Please rate the following statements in terms of how much you agree or disagree using the following scale:

- 1 = Strongly Disagree
- 2 = Disagree
- 3 = Disagree Somewhat
- 4 = Agree Somewhat
- 5 = Agree
- 6 = Strongly Agree

- _____ 1. I am willing to select to a challenging work assignment that I can learn a lot from.
- _____ 2. I often look for opportunities to develop new skills and knowledge.
- _____ 3. I enjoy challenging and difficult tasks at work where I'll learn new skills.
- _____ 4. For me, development of my ability is important enough to take risks.
- _____ 5. I prefer to work in situations that require a high level of ability and talent.
- _____ 6. I'm concerned with showing that I can perform better than my coworkers.
- _____ 7. I try to figure out what it takes to prove my ability to others at work.
- _____ 8. I enjoy it when others at work are aware of how well I am doing.
- _____ 9. I prefer to work on projects where I can prove my ability to others.
- _____ 10. I would avoid taking on a new task if there was a chance that I would appear rather incompetent to others.
- _____ 11. Avoiding a show of low ability is more important to me than learning a new skill.
- _____ 12. I'm concerned about taking on a task at work if my performance would reveal that I had low ability.
- _____ 13. I prefer to avoid situations at work where I might perform poorly.

Appendix G - Result-Oriented Efficacy

Please rate the following statements in terms of how much you agree or disagree using the following scale:

1 = Strongly Disagree

2 = Disagree

3 = Disagree Somewhat

4 = Agree Somewhat

5 = Agree

6 = Strongly Agree

- _____ 1. I believe I have the necessary skills to succeed in this program.
- _____ 2. I believe I have the necessary intelligence to succeed in this program.
- _____ 3. It is likely that I would be successful in this program.
- _____ 4. This seems like a difficult program. (r)
- _____ 5. I think I would fail in this type of program. (r)
- _____ 6. This program would be too difficult for me to undertake. (r)
- _____ 7. I have the ability it would take to succeed in this program.
- _____ 8. This program would help me be successful in a STEM-field career.
- _____ 9. I could get a STEM-related job if I were to successfully complete this program.
- _____ 10. Completing a program like this one would be a great start to my STEM career.
- _____ 11. Completing this program would not increase my knowledge of STEM. (r)
- _____ 12. Completing this program would not increase my STEM-related skills. (r)
- _____ 13. It would be unlikely that I could get a STEM-related job even after having successfully finished this program. (r)

Appendix H - Goal Orientation Training Seminar PowerPoint Slides

<h3>Goal Orientation Training Seminar</h3> 	<h3>Objectives & Agenda</h3> <ul style="list-style-type: none">▶ Introductions▶ Intro to the goal orientation frameworks▶ Discussion of the theory & framing<ul style="list-style-type: none">◦ Research & previous findings◦ Examples▶ Practice in setting & framing learning goals<ul style="list-style-type: none">◦ Peer and instructor feedback▶ Discussion of real-world relevance▶ Surveys 
<h3>Introductions</h3> <ul style="list-style-type: none">▶ Lesly R. Krome, M.S.▶ Graduate student at KSU in Industrial/Organizational psychology.▶ Received my Bachelor's in psychology at University of Alaska Anchorage.▶ I'm from Alaska. 	<h3>About you</h3> <ul style="list-style-type: none">▶ We will go around the room and you can choose to provide some basic background information:<ul style="list-style-type: none">◦ First name & nickname (if applicable)◦ Intended degree/major (or undecided)◦ Class ranking (Frsh., Soph., Jr., Sr., other)◦ Where you are from 
<h3>Goals & Goal Orientations</h3> <ul style="list-style-type: none">▶ Goal<ul style="list-style-type: none">◦ An internal representation of specific desirable states.<ul style="list-style-type: none">▪ Involves outcomes, processes, & events▪ The context in which people interpret & react to events.▶ Dispositional Goal Orientation<ul style="list-style-type: none">◦ A fairly stable pattern of thinking & behavior that occurs due to consistent pursuit of specific types of goal.<ul style="list-style-type: none">▪ Over time▪ Across situations 	<h3>Goal Orientation Research</h3> <ul style="list-style-type: none">▶ Nicholls (1984)<ul style="list-style-type: none">◦ Two different ways people tend to evaluate their success or lack thereof.<ul style="list-style-type: none">▪ Ego Involvement<ul style="list-style-type: none">▪ Using others as a reference point for low/high ability for a specific achievement.▪ Task Involvement<ul style="list-style-type: none">▪ Mastery of a topic is gained through learning & improved by effort.◦ Mastery of a subject is either self-referenced or other-referenced. 

Goal Orientation Research

- ▶ Elliott & Dweck (1988)
 - Performance Goal Orientation (PGO)
 - Individuals want to gain or maintain positive evaluations of his/her ability & avoid negative evaluation.
 - Seek to demonstrate & validate one's ability, while not discrediting it.
 - Desire to appear competent to others
 - Learning Goal Orientation (LGO)
 - Individuals attempt to increase their abilities and/or master new abilities.
 - Desire to increase & refine abilities/competency.

Why?

- ▶ One's conception of ability/intelligence.
 - Entity Theory
 - Individuals view intelligence/ability as fixed & unchangeable; trying to improve one's ability or intelligence is a wasted effort.
 - These individuals are more likely to adopt a PGO & try to maintain or improve how others perceive their competency.
 - Incremental Theory
 - Individuals view intelligence & ability as malleable.
 - These individuals believe they are able to improve their competencies & are more apt to adopt a LGO.

The Current GO Framework

- 1) performance–approach goal orientations → ego
- Seek to attain favorable judgments about their abilities by demonstrating competency.
 - May view ability/intelligence as unchangeable, & so only demonstrate their ability/knowledge in the areas in which they are *already* competent.
 - Choosing only tasks they feel comfortable executing & can perform well compared to their peers.

The Current GO Framework

- 2) performance–avoidance goal orientations → fear
- Focused on avoiding unfavorable judgments about abilities & negative comparisons to peers.
 - These individuals also choose tasks that they feel they can execute adequately.
 - However, the motivation is to avoid gaining undesirable feedback regarding abilities/intelligence (which is viewed as fixed).

The Current G.O. Framework

- 3) learning goal orientations → mastery
- Focus on gaining proficiency of new tasks, acquiring knowledge, & increasing skills.
 - Because of the belief that intelligence/ability are malleable & can be improved upon, individuals are typically not afraid to try new tasks.
 - May not immediately be proficient, but they can improve & ultimately master.

The Purpose for this Seminar

- ▶ To encourage you to adopt the Incremental Theory & view intelligence/ability as malleable.
- ▶ To encourage you to adopt LGO so that you can better focus on improving your competencies & achieving your goals, rather than comparing yourself to others.
 - The competition is with yourself.
- ▶ To learn to frame goals in this way so as to encourage this behavior in the future.
 - So many positive outcomes are associated w/ LGO.

LGO

- ▶ Individuals w/ LGO have been found to have:
 - greater self-efficacy
 - task interest
 - positive affect
 - intrinsic motivation
 - greater effort & persistence in completing tasks
- ▶ Example:
 - The student who takes a senior-level biology class in his or her sophomore year; although the student may not be certain he or she will get top marks, the student is interested in increasing his or her knowledge in biology & sees the benefit of being challenged with a difficult but informative course.

Performance-Approach GO

- ▶ Outcomes & findings for individuals w/ performance-approach goal orientations are mixed.
 - increased performance
 - no intrinsic motivation
- ▶ Example:
 - The student who takes a senior-level biology class in his or her sophomore year, not because of a personal interest in the class, but because the person's sibling took it & the student is competitive & wants a better grade than his/her sibling earned.

Performance-Avoidance GO

- ▶ Individuals who are performance-avoidant tend to show:
 - negative affect
 - learned helplessness
 - avoidance of challenges
 - deteriorated performance
- ▶ Example:
 - The student refuses to take the senior-level biology class even though it is his or her senior year because the teacher is new & he/she fears failing.

Situational Goal Orientations

- ▶ Goal orientations can also be influenced situationally.
 - Different goal orientations can be activated at the same time for a specific task (Pintrich, 2000).
- ▶ An individual may have the disposition to adopt a particular goal orientation when confronted with a challenge, but circumstances may alter his/her response patterns.

Goal Framing

- ▶ Framing effect = cognitive bias directing behavior
 - How you "spin" a goal
- ▶ LGO framing is...
 - Self-referenced (not concerned w/ outside evaluation).
 - Seeking self-improvement for the sake of improvement.
 - With the idea that ability & intelligence can be increased.

Practice

- ▶ First exercise:
 - On a blank sheet of paper, write down three of your goals.
 - Then frame your goals to reflect a LGO.
 - I'll come by and provide feedback.
- ▶ Example:
 - Goal is to obtain your B.A. in psychology.
 - I want to achieve my B.A. in psychology so that I can understand people better and to further my knowledge in the field and to begin my career.

Practice

- ▶ Second exercise:
 - Break into groups of two or three and share your goal with your partner.
 - Provide feedback to your partner regarding his/her goal and whether it is LGO.
 - Discuss why the way you framed your goal is LGO.
 - I'll come by and provide feedback as well.

Practice

- ▶ Third (and final) exercise:
 - With your partner/group, come up with a new LGO goal.
 - Write down why this is a LGO-framed goal.
 - What makes it LGO as opposed to PGO?

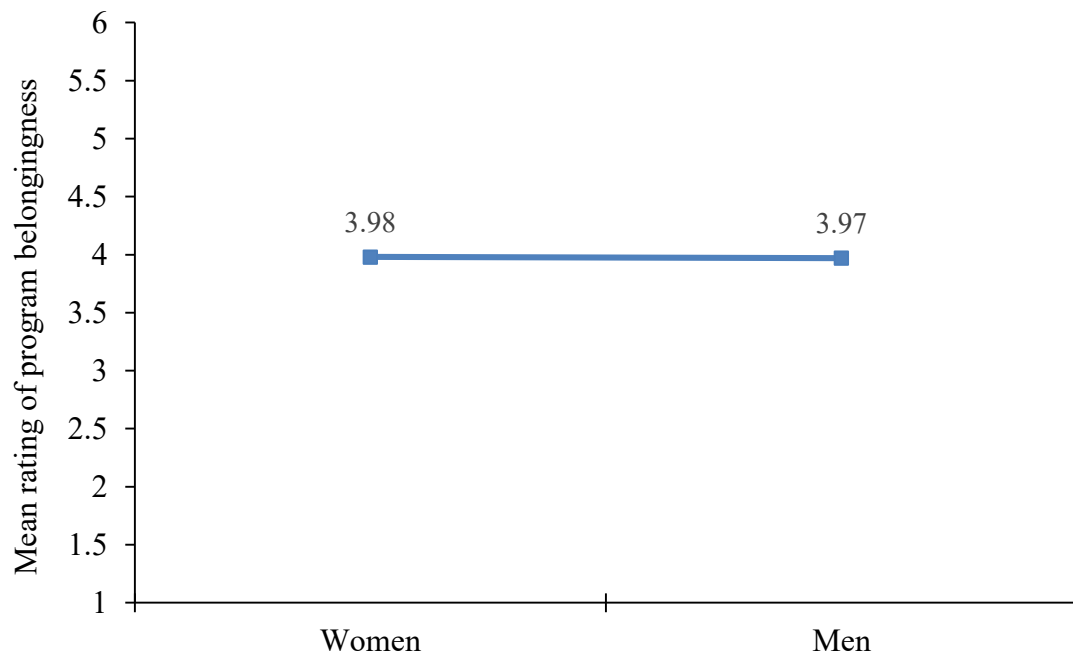
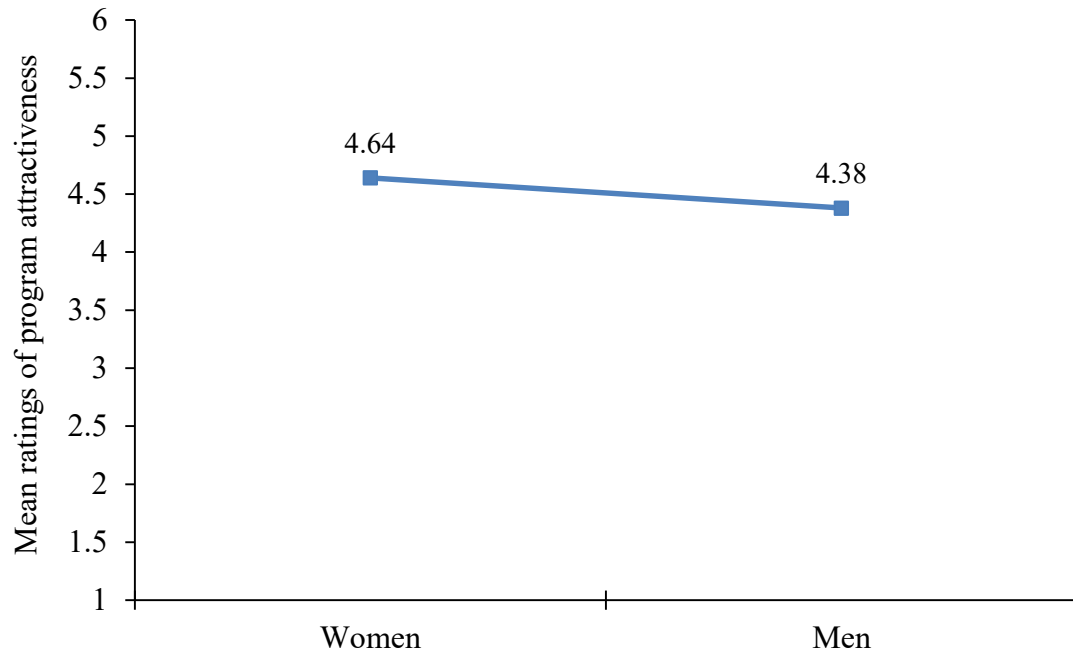
Why this is important

- ▶ Apply positive framing to your life and use a LGO to set goals.
 - May result in greater self-efficacy, task interest, positive attitude, increased intrinsic motivation, and greater effort & persistence in completing tasks.
 - You are more likely to accomplish your goals & be happy about them than if you were to engage in PGO.

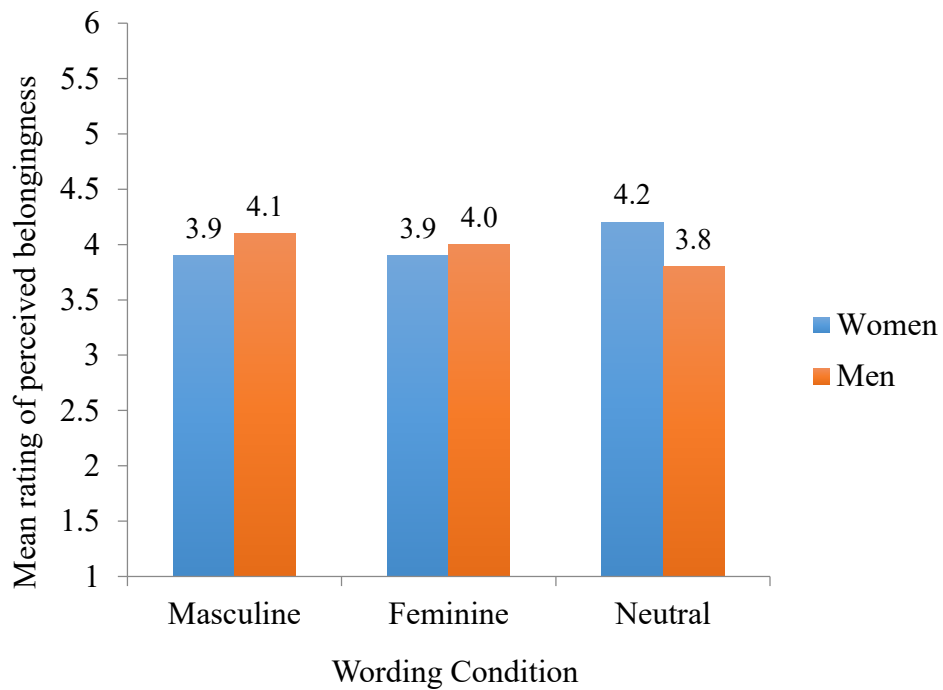
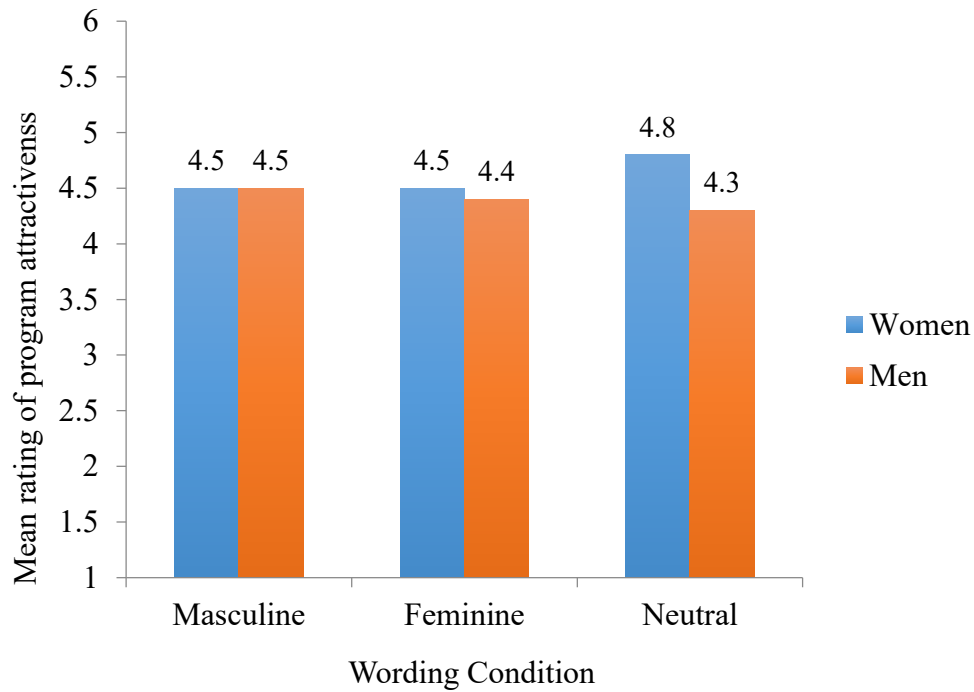
Surveys

- ▶ There are three surveys to be completed.
- ▶ Once you have filled out all of the surveys, you can take a debriefing form at be on your way.
- ▶ Be sure to sign up to enter the drawing for the \$100 Amazon gift-card.

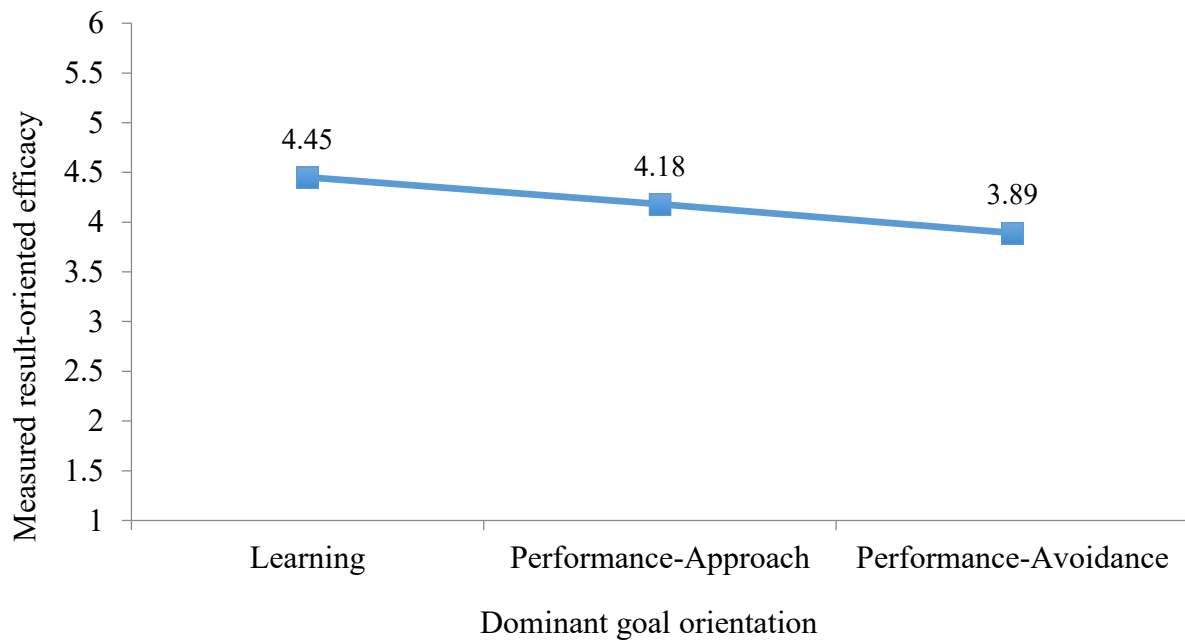
Appendix I - Experiment 1: Mean ratings of program attractiveness and perceived belongingness by participant sex



Appendix J - Experiment 1: Means ratings of program attractiveness and perceived belongingness by wording condition



Appendix K - Experiment 2: Mean result-oriented efficacy by goal orientations



Appendix L - Experiment 3: Mean learning goal orientation score and result-oriented efficacy by condition after data transformation

